SRA TECHNOLOGIES

# Roadmap for Navy Civilian Personnel Research

May 1984
Final Report

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The purpose of this project was to develop a roadmap or plan for systematically targeting research efforts at the most critical issues involving the Navy civilian workforce. The roadmap includes a model for prioritizing research projects and for managing research efforts through time. Five tasks were involved in this process: (1) establishing the goals and objectives of the Navy Civilian Personnel Program; (2) Selecting study participants from diverse groups knowledgable about civilian personnel issues; (3) conducting 40 open-ended interviews to determine a set of research needs perceived as most important to meeting Navy objectives; (4) constructing of convergence charts which organized potential research areas into logical sequences of research activities leading toward the attainment of Navy objectives; (5) conducting a targeted review of the literature to identify existing knowledge pertinent to each research area.

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Five research arrays were developed dealing with manpower requirements, recruitment, retention, productivity and Equal Employment Opportunity objectives for Navy civilian personnel programs. Each research array is broken down into sequential phases; each phase is segmented into specific research areas. For each research area, key research issues are described and existing knowledge is summarized.

# ROADMAP FOR

# NAVY CIVILIAN PERSONNEL RESEARCH

MAY 1984


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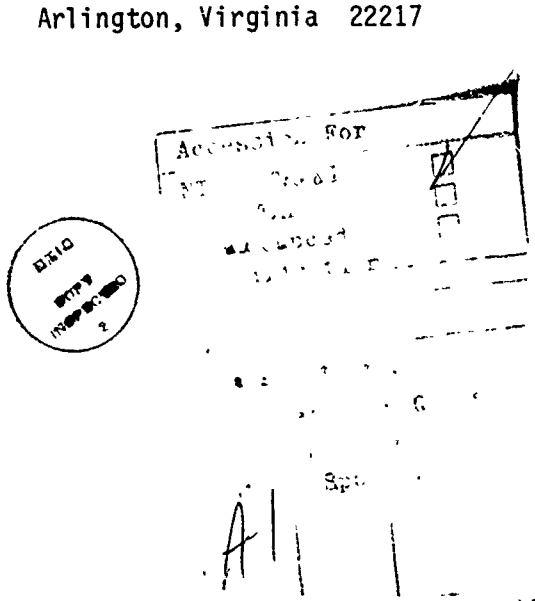

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## EXECUTIVE SUMMARY

This project was designed and implemented in order to respond to the needs of the Navy for a research plan to gather systematic information on the large civilian personnel workforce which supports the Navy's mission. The Roadmap provides a framework for capturing and analyzing the information necessary to formulate and implement effective civilian personnel policies and programs. In addition, this report includes a detailed procedure for prioritizing the accumulated research suggestions and a management plan which provides the structure for ongoing research management.

SRA project staff worked in conjunction with a Project Guidance Team (PGT), consisting of representatives of the Navy Civilian Personnel Policy Division, Navy Personnel Research and Development Center, the Naval Material Command, OP-01, and the Office of Naval Research.

Through consultation with the PGT, key objectives of the Navy personnel program were elicited. These objectives were:

- Determining civilian personnel manpower needs;
- Recruiting civilian personnel;
- Retaining needed civilian personnel;
- Maximizing the productivity of the civilian workforce;
- Creating and maintaining Equal Employment Opportunity; and
- Improving the cost-benefit of specific civilian personnel functions.

Using the objectives as a structure for an open-ended interview guide, SRA staff then conducted forty interviews with seven different constituent groups, consisting of selected representatives of:

- Navy Civilian Policy Personnel;
- Navy Civilian Program Managers;
- Navy Military Program Managers;
- Military Civilian Personnel Research Community;
- Civilian Employee Organizations;
- Navy Personnel Staff Specialists; and
- DoD and OPM Federal Workforce Policy Personnel.

Each study participant was requested to offer research suggestions and to discuss knowledge needs pertinent to the specific objectives about which they had the most knowledge, experience, and concern.

Although a chi-square test indicated no statistically significant relationship between membership in a group and objectives chosen for discussion, each of the objectives was responded to in the course of the forty interviews. The objectives most often chosen, in descending order, were:

- o Productivity
- o Retention
- o Recruitment
- o Determinination of civilian manpower needs
- o Equal Employment Opportunity
- o Cost-Benefit

Subsequent analysis of the interview data yielded a series of convergence charts, which depict research arrays which are segmented into a series of sequentially-ordered phases with each broken down into more specific research areas. The cost-benefit objective does not appear as a research area because all of the research suggestions in that area more logically fell into one of the five preceeding objectives.

The Manpower requirements array is composed of three phases:

- Analyze issues determining civilian personnel requirements;
- Develop a valid forecasting model; and
- Define strategies to integrate forecasting into budgetary decision-making.

The research arrays for recruitment, retention, productivity and EEO, could all be broken down into identical four-phased research sequences:

- Establish baseline measures;
- Analyze issues;
- Identify potential strategies; and
- Test and evaluate promising strategies.

The specific research areas differ within each objective, although there were many (e.g., analyzing career patterns, compensation issues) which were pertinent to and cross-cut a number of objectives.

Each research phase includes a background statement which discusses in more detail the specific research ideas suggested. Also included is a descriptive summary statement of the existing literature available on the topic.

The Roadmap is a research plan at its present stage. In order to convert it into a research agenda, there is a need for prioritization of the research suggestions. This could be accomplished by a two step process. The first step would be to go back to the original study participants and request that they rank each research area on three measures:

- The relative importance to the Navy of improving effectiveness in a particular area;
- The relative need for new information; and
- The likelihood of being able to utilize research findings to help reach an objective.

Following this, a smaller group, perhaps the original Project Guidance Team would prioritize the highest ranked research areas, using technical financial feasibility as a fundamental criteria.

In addition to prioritized research area, a research agenda is dependent upon a research management system. This system has seven components:

- Goal definition;
- Research plan development;
- Selection of research projects;
- Research monitoring;
- Evaluation of research findings;
- Dissemination of knowledge; and
- Research utilization.

It is suggested that there is a need for both a planning coordinator and a coordinating committee.

Completion of the proposed prioritization process and implementation of the key features of the research management system, using the Roadmap as a foundation, should lead to the incorporation of a strong and productive civilian personnel research program.

# I. INTRODUCTION

## BACKGROUND

This "Roadmap," a plan for identification, prioritization, and management of research activities, is the second one to be conducted for the Office of Naval Research. The first Roadmap was developed in 1980 for the newly reorganized Family Support Program. Because of the perceived value of that document to both program managers and researchers, the Office of Naval Research in 1983 solicited research proposals to develop a similar document for the Naval Civilian Personnel Policy organization, jointly funded by OP-14 and the Navy Personnel Research and Development Center.

Based upon extensive interviews with a diverse array of individuals knowledgeable about civilian personnel issues, the Roadmap identifies a number of research areas ranging from basic to applied, including research of potential interest to the entire Federal workforce, as well as areas specifically applicable to the Navy civilian workforce. Each research area described contains a brief background statement of significant issues and a discussion of related research endeavors. The Roadmap also contains a detailed outline of a prioritization model, which is the next logical step in the roadmap process, and a research management plan designed to continually update the Roadmap as research needs arise.

The function of Roadmap research is to provide Navy civilian policy and program personnel with a systematic framework for developing the knowledge base necessary for effective implementation of the diverse but related objectives of the civilian personnel program.

## PROJECT OVERVIEW

The information in this document includes the major objectives and enabling objectives of the Navy civilian personnel program as they were elicited from the OP-14 staff and then modified and confirmed by the

Project Guidance Team (PGT). The PGT included representatives from the Navy Material Command, the Office of Naval Research, the Navy Personnel Research and Development Center, and other organizations within OP-NAV. Research or knowledge needs, organized by each objective, were then elicited from a wide range of study participants. These participants include Navy civilian and active duty personnel, representatives of civilian employee organizations, civilian personnel researchers, Office of Personnel Management (OPM) and Department of Defense (DoD) participants.

Based on the objectives, research needs were identified in the course of the interviews and arranged in five research arrays which are categorized as:

- Manpower Requirements
- Recruitment
- Retention
- Productivity
- Equal Employment Opportunity

Within each array, a series of research phases are described in a sequential flow. Each research area within each phase includes a background statement, which describes in more detail the content and direction of the research endeavor and the context in which the research would fit. Each research phase ends with a brief summary of the relevant research which has already been accomplished and points out where research results are not readily available or have not been attempted.

It should be pointed out that there are distinct limitations to the Roadmap in its current form. As the reader will note, the identified research areas are quite diverse in scope. Thus any particular area may well constitute either a series of projects or might be subsumed under some larger project. Each area is not to be construed as a specific research project. Furthermore, the Roadmap presents a synthesis of suggestions and

information needs as they were presented in the course of the interviews. No attempt was made to evaluate the feasibility of research ideas in terms of funding or personnel resources necessary to carry them out, nor is there any discussion of what funding sources would be most appropriate for the various research areas.

As presented, this project is essentially "meta-research," that is, research about research. It is less like a blueprint of a ship than like an inventory of the tools available to construct a ship. Moreover, it contains a series of suggestions about what tools must still be procured and how that procurement process can be carried out in a logical and systematic fashion.

This document contains six sections. Section I briefly describes the background and overview of the project. Section II discusses the methodology by which the Roadmap was created step-by-step. Section III presents the reader with some of the primary themes which emerged in the course of the interviews, discusses the relative importance of the objectives as defined by the study participants, and discusses various methodological approaches suggested by them for carrying out the research suggestions.

Section IV consists of graphic depictions of the five research arrays, a discussion of the research phases, and a summary of the existing knowledge pertaining to each phase. A summary of each research array is also included.

Section V presents a detailed model for prioritizing the research suggestions while Section VI, the last section, presents a strategy for maintaining the Roadmap as an on-going research management system for Navy civilian personnel research.

Appendices include a list of the individuals who were interviewed for research suggestions, a copy of the interview guide, and a list of references cited in the text.

## II. METHODOLOGY

### RESEARCH PLAN

In order to create a framework for capturing, analyzing, and managing the needs of the Navy to develop a knowledge base concerning its very large civilian workforce, our research plan, carried out in consultation with the Project Guidance Team, consisted of the following steps:

- Eliciting and charting the key objectives of the Navy civilian personnel programs;
- Identifying categories of key players in the personnel process and selecting study participants from each of the categories;
- Developing an open-ended interview schedule which elicited information needs pertinent to the carrying out of the stated objectives;
- Analyzing the universe of identified research needs and organizing them into logical, sequential arrays;
- Assessing the existing readily-available research findings pertinent to the identified knowledge needs;
- Devising a prioritization model, which includes input from policy and operations personnel, but can be carried out with a minimum of personnel time and cost; and
- Preparing a research management plan which creates an efficient and streamlined research program.

### SPECIFICATION OF OBJECTIVES

The first step in developing the Roadmap was to ascertain the goal, objectives and enabling objectives of the Navy civilian personnel program. This hierarchy represents the major responsibilities of the civilian personnel organization. It was elicited by examining the background materials made available to the project staff and by consulting personnel in the civilian manpower and personnel community, individuals from OP-14 and the Civilian Manpower Division of the Navy Comptroller's office.

Once a draft set of objectives and enabling objectives was constructed, it was presented to the Project Guidance Team and modified according to their comments and suggestions.

The hierarchy of goals, objectives and enabling objectives are depicted by Figure II-1 on the following page. This hierarchy then formed the structure of the interview schedule designed to elicit knowledge needs in those designated areas. In this way, information needs were tied in specifically and directly to the programmatic tasks of the civilian personnel program.

## IDENTIFICATION OF RESEARCH NEEDS

### PARTICIPANT SELECTION

In conjunction with the Project Guidance Team, a set of 40 study participants were selected to contribute to the identification of research needs through interviews.

The selection was based on the assumption that diversity of experience and perspectives would enhance the quality of the data.

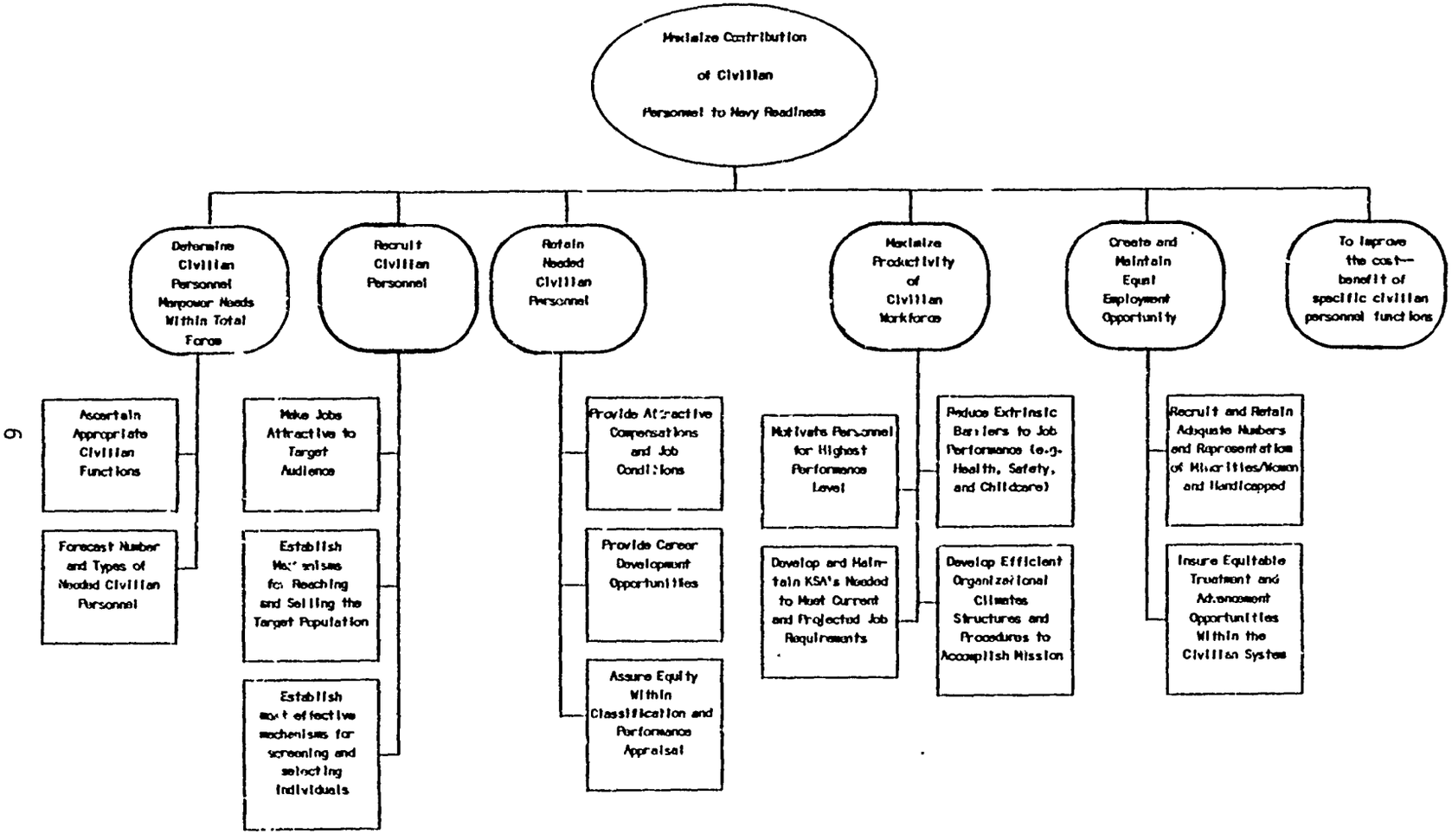
Participants were thus drawn from seven different groups. The individuals constitute a purposeful rather than a random sample. They were chosen on the basis of their wide knowledge and experience in personnel functions (e.g., labor and employee relations, personnel management and evaluation) both from a headquarters and field perspective; if active-duty individuals, they were interviewed because of their experience in managing a large population of civilian employees; researchers were chosen who were particularly experienced in civilian personnel issues. The majority were either SES or the flag equivalent, or upper-level GM employees, those who had had many years of government service, and a breadth of experience.

Participants came from the following groups:

- Navy Civilian Policy Personnel--such as selected high-level staff from the Naval Civilian Personnel Policy Division (OP-14) and the Naval Civilian Personnel Command;

FIGURE II-1

GOAL, OBJECTIVES AND ENABLING OBJECTIVES OF
THE NAVY CIVILIAN PERSONNEL PROGRAM



- Navy Civilian Program Managers--such as the Deputy Chief or Deputy Commander of the Naval Material Command or the Systems Commands;

- Navy Military Program Managers--including commanding officers of shore establishments or of headquarters organizations with large civilian personnel populations;

- Military Civilian Personnel Research Community--including staff from the Navy Personnel Research and Development Center and faculty from the Federal Executive Institute;

- Civilian Employee Organizations--such as representatives of the American Federation of Government Employees and the Federal Managers Association;

- Navy Personnel Staff Specialists--such as those experienced in industrial relations, recruiting, and EEO, at both field and headquarters locations;

- Department of Defense (DoD) and other Federal Workforce Policy Personnel--for instance, staff from the Office of the Assistant Secretary of Defense for Manpower, Reserve Affairs and Logistics (MRAL), the Office of Personnel Managment.

A letter signed by OP-14 was sent to each participant, explaining the nature of the Roadmap project and requesting their time and cooperation. A copy of the objectives chart accompanied the letter. The list of participants can be found in Appendix A.

## INSTRUMENT DESIGN

A structured, open-ended interview guide was developed, pre-tested and modified based upon the set of objectives and enabling objectives constructed in consultation with the Project Guidance Team. For each enabling objective, questions were developed in order to ascertain:

- If existing knowledge is sufficient;

- What specific additional information the Navy needs to know to accomplish the objective;

- Of the information needs discussed, which are considered to be of primary and which of secondary importance;

- If the research results might be useful to other organizations within or outside the Navy; and

- Any studies already available.

A copy of the Interview Guide is included as Appendix B.

## INTERVIEWS

The response rate to the request for interviews was 100 percent. Forty interviews were conducted over a period of approximately two and a half months from November 1983 through mid-January 1984. The majority of the interviews were conducted in-person in the Washington area. Because of additional funding from NPRDC, the Project Director was able to conduct some personal interviews in the San Diego area. Three interviews were done by telephone. Fifty-eight individuals were actually involved because in many cases the designated study participant invited colleagues to join in the interview and research suggestions were offered by each.

Although the time originally requested for the interview was at least one hour, the majority of the study participants spent over two hours in discussion with the interviewers, and some sent additional information subsequent to the interview. The participants offered a wealth of information as well as responses which were carefully thought out and indicated a high degree of interest.

Each participant had already received a copy of the objectives chart and had, prior to the interview, chosen the specific objectives he or she wished to discuss based on personal knowledge and experience. While some participants chose to concentrate on one or two of the objectives, others addressed themselves to all the research areas.

Although it was hypothesized that the objectives chosen for discussion would vary according to membership in the seven groups, no evidence was found to support this hypothesis. A chi-square goodness of fit measure of their choices indicates that a statistically significant relationship between interviewee and objective chosen fails even at the 0.1 level of significance. Even when the seven groups are recategorized as "personnelists" vs. "non-personnelists" there is no statistically significant relationship.

## ANALYSIS

The Roadmap interview process consisted of asking questions about what questions needed to be asked and answered. Since this is not commonly done in interviewing and because the majority of the study participants are skilled in areas other than research formulation, the wealth of raw data contained in the interviewing sheets needed much reexamination.

The three interviewers worked together closely to assure that similar research suggestions were categorized uniformly and correctly by area. The data from the interview guides were broken down into small units and then re-integrated and synthesized into more general categories. In many cases, "information needs" had to be translated into researchable concepts. In other cases, a decision had to be made about whether or not an idea or suggestion or comment was in fact researchable.

It should be noted that, although the content of research ideas or suggestions were not substantially changed, the categorizations made by study participants were often revised. A research suggestion made by one study participant addressing productivity might have been identical or very similar to a suggestion made by another participant discussing the retention objective. Project staff then made a decision about where the suggestion best fit in terms of objectives.

Once the categories were established, a convergence chart technique was used to display those categories or areas in a logical and sequential order. This technique was used in the Roadmap constructed for the Navy Family Support Program; it is a modification of a model first developed by the National Cancer Institute for planning biomedical research programs. Research categories are arranged in a series of arrays which depict research program elements in a hierarchy of phases, areas and individual projects, ordered on the basis of research logic. Decision points are indicated so as to make clear the role of one set of research activities in providing knowledge essential to further research activities or objectives.

Because the nature of biomedical research is in many ways quite different from the nature of the research needed in the civilian personnel area, the modification of the technique was substantial. The primary difference is that this Roadmap does not always bind personnel policy research to the completion of one phase in a research array before work could be begun in the next phase in the sequence. For example, a number of the research areas which occur in the "Issues" phase of the five arrays can be addressed without the prior "Baseline" phase research results. On the other hand, those phases concerned with testing and evaluating strategies must be built upon work in the previous phases, which develop or identify strategies. Of course, Roadmap research should procede sequentially in an ideal world (i.e., if there were unlimited funding and research personnel available).

## ASSESSMENT OF EXISTING KNOWLEDGE

The collection of civilian personnel research materials began at the initiation of the project. The National Technical Information Service was searched for sources, and materials were collected from OP-14 staff members and other Navy personnel.

The interview sessions were also used to collect references and, in some instances, material from the study participants.

Once the research arrays were drafted, a targeted search of existing literature keyed to identified research areas was conducted to determine the information that already exists and to ascertain significant gaps in the literature.

The research arrays were used to structure the reference materials previously collected. Available bibliographies were consulted and pertinent sources from them were organized according to their fit with the research agenda specified in the Roadmap. The most extensive existing

pertinent bibliographies were Thomas J. Koslowski, et al. The Civilian Workforce in Military Organizations: An Annotated Bibliography and the Navy Personnel Research and Development Center's Consolidated Bibliography of Unclassified Technical Reports, and Technical Notes: FY 1974 through 1981. A search was made of the holdings of the library of the Office of Personnel Management that followed-up on particular citations previously noted as well as the items of research needs identified under the research arrays.

Because of limited resources for this literature search and the extensive coverage of the research roadmap, no claim can be made that this survey of the existing literature is exhaustive. Nevertheless, this literature search was sufficiently extensive to provide "starting gates" for further research on the majority of the lanes of inquiry identified in the Roadmap.

In terms of prioritizing and delimiting the research universe, the major emphasis was placed upon locating references most pertinent to Navy civilian personnel as a specific population. The secondary emphasis was placed upon finding material relevant to all DoD civilian personnel. Lastly, but in some areas most fruitfully, literature sources were located which address the Federal personnel workforce as a whole. Although there is a vast body of literature dealing with personnel and managerial or administrative issues in the United States in general as well as internationally, this body of literature was not extensively tapped. The exception to this was in the case of any specific references mentioned during the interview process.

## III. INTERVIEW OVERVIEW: THEMES AND PATTERNS

### OBJECTIVES

Since all 40 study participants were asked to choose the objectives on which they wished to concentrate in the interview and were not required to deal with all of them, it was conceivable that some of the objectives might have been omitted. This was not the case, and by the end of the interviewing process every objective had been addressed.

Analysis of the accumulated interviewing data revealed that:

- The objective concerning improving the cost-benefit of specific civilian functions elicited a number of research suggestions. However, since all of those suggestions were more logically incorporated under the other five objectives, it was not maintained as a separate objective nor does it appear as a distinct research array.

- The objective most frequently addressed (by 27 study participants) concerned maximizing the productivity of the civilian workforce. This objective elicited the most numerous research ideas and information needs.

- Retention of needed civilian personnel was the second most frequently discussed objective (22 participants). It reflects much concern about keeping highly qualified and trained individuals despite a climate perceived to be hostile to the Federal workforce and subject to increasing erosion of benefits.

- Recruitment was third in frequency of response (17 participants). A number of participants noted that current labor market conditions acted in favor of civilian recruitment but pointed out that such conditions would soon change and effective planning for this change was needed.

### TOPICS

It became clear after a number of interviews that certain themes repeatedly appeared, often originally categorized under more than one objective.

In terms of personnel forecasting, recruitment, and retention, participants were most interested in scientists and engineers of all the occupational categories in the Federal system. This perhaps reflects the major role of the Naval Material Command in the Department of the Navy, the preponderance of "S&E's" needed by that command, and the differential salary levels between the public and private sectors for individuals in those highly technical occupations.

There was also a cluster of information needs about the managerial role in the Navy System: How good managers could be selected and nurtured; how best to train them for that role; what constituted a "good" manager in the highly varied organizations that make up the Navy; how military and civilian interpretations of the role of the manager differed and the consequences of those differences; what particular skills were necessary to make a transition between a technical role and a supervisory one. This emphasis on the manager may reflect the fact that most of our study participants were from the managerial ranks themselves, or it may reflect a focus of concern in the larger administrative world of both the public and private sectors.

In terms of the "mechanics" of the personnel process, a topic which was brought up was the time lag in filling vacant positions. Study participants brought this up as hindering recruitment, causing attrition, and lowering productivity.

Another topic mentioned was the impact of the abolition of the Professional and Administrative Career Examination (PACE) as a vehicle for recruiting college graduates interested in administrative career positions. A number of study participants pointed out the necessity to conduct research to establish the need for similar examining vehicles, as well as research to develop valid entry-level exams for a number of occupational categories in administration.

Many of the study participants discussed in some detail their perceptions of the prevailing climate within the Federal workforce in general and

the Navy in particular. Although DoD personnel have not been subjected to Reduction-in-Force procedures, as have other Federal personnel, many of them felt beleaguered. Specifically, there was concern about the effect of the new retirement system and possible changes in the existing one. There was also concern about the changes brought about by the Civil Service Reform Act, such as the creation of the Senior Executive Service and the Merit Pay Appraisal system. Some individuals pointed out that the Federal employment system, particularly the retirement system, had been historically considered a model to be emulated by private business. Not only is this no longer true, but the private sector now has a number of "promising practices" in terms of benefits and management techniques which the Federal sector should seek to incorporate. There was a need expressed to combat the prevailing negative stereotype of the Federal worker. The "translation" of these concerns into specific research areas was difficult in some cases, but most often resulted in research ideas which should be pursued to meet retention, productivity, and recruitment objectives.

## METHODOLOGIES

The interviewers did not specifically request participants to suggest how their research ideas could be carried out; nevertheless, a number of study participants volunteered suggestions about how to obtain the data they felt was needed. Four types of approaches were frequently suggested:

- Analyze "good" situations and ascertain the critical factors--for example, if a particular Naval Air Rework Facility demonstrates a high level of productivity, or a shipyard attracts a large number of women with technical skills, these activities should be closely scrutinized, the successful techniques isolated, and replicated elsewhere.

- Analyze "poor" situations and ascertain the critical factors--for instance, organizations which have an appreciably higher number of discrimination complaints or unfair labor practice grievances would be examined, not just to attempt to ameliorate that specific situation, but also to develop preventive strategies for managers in other organizations.

- Conduct organizational ethnographies--for example, compare and contrast the organizational cultures which exist within a supply center, or an R&D lab, or a CCPO. The resulting descriptive data could then be utilized in a number of contexts such as management training, productivity studies and information for new employees.

- Compare the private and public sectors--for instance, examine the perquisites, managerial selection and training, and compensation packages available among the Forture 500 companies and assess the possibilities for adopting any "promising practices" into the Navy system.

## TYPOLOGY OF DATA NEEDS

An overview of the cumulative interview material revealed that certain types of data were consistently requested by study participants. These include:

- Navy-wide data bases--for example, compilation of information now collected at the activity level about numbers of grievances, personnel qualifications, manpower projections, etc.

- Representative samples of personnel populations--such as Hispanics, or cohorts grouped by when they began working for the Navy, or procurement specialists, or other groups suitable for survey research.

- "Impact" research--for instance, examining the effect on individual decisions to begin or retain careers in the Navy of Merit Pay, or changes in the retirement system, or bonuses.

- Documentation of experentially-known situations--many study participants noted that, although they knew something to be true because of their own experience, they needed documentation, usually quantitative, to validate their knowledge. Validation was wanted, for example, for the observations that training in team-building has positive effects on both the individual and the organization in a long-term sense and that electrical engineers frequently become excellent computer scientists.
- "Translated" research--study participants pointed out a need to take highly sophisticated basic research in areas such as manpower modeling or psychological studies of motivation and rewrite them so that they become useful tools for day-to-day management of activities and personnel.

The next section organizes into five separate research areas a fuller elaboration of the research concerns extracted from the interviews.

# IV. RESEARCH AREAS

## INTRODUCTION

This chapter discusses the results of the interviews conducted in order to elicit the primary research areas which must be addressed to meet the overall program goal and specific objectives of the Navy civilian personnel policy organization. The research areas identified throughout the interview process were categorized into the following areas:

- Manpower Requirements;
- Recruitment;
- Retention;
- Productivity; and
- Equal Employment Opportunity.

Convergence charts have been designed which graphically depict the five research areas listed above. Each chart is comprised of a logical sequence of research phases, which moves as a linear array from basic to more applied work. After most phases, a judgment can be made as to whether there is sufficient knowledge to proceed or whether more data must be collected. Research results are seen as the basis for policy recommendations and/or training and technical assistance throughout the Navy. Policy recommendations stemming from research findings might also be directed outside the Navy to such organizations as the Office of Personnel Management, the Office of the Secretary of Defense, and Congress.

It should be noted that while each of the five objectives, under which research areas are arranged, are independently important to the Navy mission, the strategies for accomplishing those objectives are highly interactive. Consequently, the research areas in each array may overlap, and research results in one array may have implications for another objective.

For example, compensation issues might be analyzed to determine their effect on recruitment, retention, or productivity. Even though the specific issues to be examined may be somewhat different in each case, it is certainly possible and may be highly desirable to incorporate all three concerns into a sequence of research projects on compensation.

Other research areas which overlap two or more arrays include:

- Labor supply
- Screening
- Monetary and non-monetary benefits
- Technology impacts
- Classification and appraisal systems

The Roadmap identifies how research in these areas will contribute to the specific mission-related objectives. The proposed prioritization process (Section V) incorporates steps to identify desired research projects or sequences of projects which maximize opportunities to meet multiple objectives.

## MANPOWER REQUIREMENTS

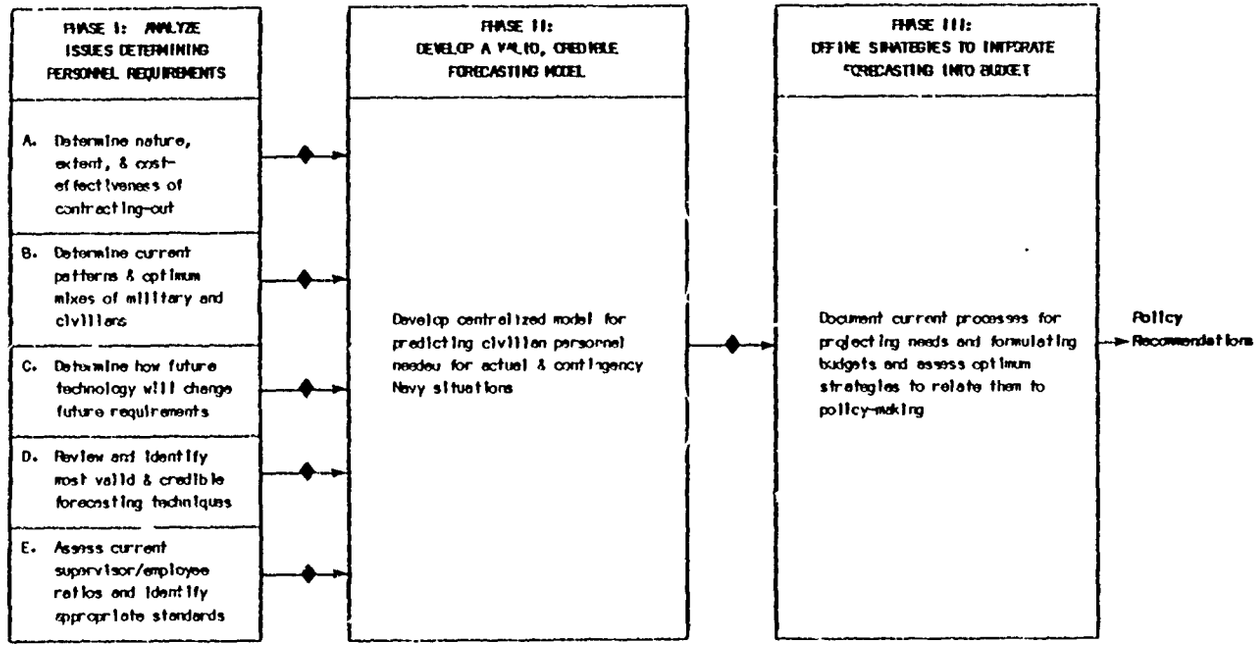
### OVERVIEW

This particular research area elicited fewer suggestions than did any of the others as shown in Figure IV-1 on the following page. In some cases participants suggested this was a political arena not amenable to research efforts. Others emphasized the need for:

- Centralized planning beyond activity-by-activity efforts;
- Coordination with military manpower analysts;
- Long-range planning; and
- Translation of existing mathematical models into usable form for policy makers.

Many participants noted dissatisfaction with the short-term and reactive nature of the present procedures for determining manpower requirements. The need for both long-range and integrated planning of active-duty, reservist, contractor, and civilian personnel (i.e., to create a genuine "total force" planning mechanism) was frequently mentioned. This need was expressed by civilian participants in the study as well as by the military personnel interviewed. There was also a need expressed for research results to help articulate and defend both present and predicted personnel requirements that would go beyond simple reliance on past estimates. This research should consider the entire civilian workforce Navy-wide as well as focusing on particular activities.

FIGURE IV-1
CONVERGENCE CHART:
ARRAY OF MANPOWER REQUIREMENTS RESEARCH




◆ Is there sufficient knowledge about the subject?

- If yes, proceed to next phase
- If no, additional research is required

## PHASE I: ANALYZE ISSUES DETERMINING PERSONNEL REQUIREMENTS

### A. Determine Nature, Extent and Cost-Effectiveness of Contracting-Out Now Occurring

#### Background

Interviewees expressed a need to develop a wider picture of the work now being contracted out by Navy activities, including research and development functions within the laboratory setting. Research should answer questions such as:

- How many contractors now work for the Navy?
- Where are they working?
- In what situations?
- What degree of civilian supervision and monitoring is required?
- How do costs and performance compare with government employees over an extended period of time?

This data could then be used to conduct informed trade-off analyses to determine what constitutes the most effective military-civilian-contractor mix in various work situations.

#### Existing Knowledge

Gollub and Hatry 1981 cited the identification of public functions for possible contracting-out as an objective of the development of aggregate productivity measures suitable for comparing the efficiency of public and private sectors. Issues concerning the development of valid measures for this purpose are presented in the Existing Knowledge section of Productivity Phase I. The Department of Defense 1976a presented an overview of contract services as a component of the manpower usage of the mid-1970s, discussed the existing policy for securing contract services, addressed legal and political issues, highlighted DoD experience with contract services, and discussed systems for reporting on contract services.

Broedling et al. 1980 found that contracting-out was used at a Navy industrial facility as a response to personnel ceilings even when a strict cost-benefit accounting might not have warranted it. Whitehurst 1978 argued that it would be more economical if the Navy relied completely on private shipyards for its defense needs. The National Research Council 1982 study of naval shipbuilding recommended reassessment of the scope and duration of ship procurement contracts. The Logistics Management Institute under a contract with Office of the Secretary of Defense is seeking to extend more generally to Base Operations Systems the lessons learned from the military's Commercial Activity Program that produced savings by competing certain base services between in-house providers and private contractors regardless of whether the service was contracted out or kept in-house.

## B: Determine Current Patterns in Military Billets and Civilian Personnel Mixes and Identify Optimum Situations

### Background

Some individuals expressed the view that the Total Force concept -- the combining of military active-duty and reservists, civil service personnel and contracted personnel in optimal ratios -- was still more conceptual than actual. Further, it was noted that the structure and procedures in place for active-duty personnel planning was not duplicated within the Navy civilian organization. In addition, it was suggested that a large investment in research in this area would not be worthwhile because of the highly political nature of the situation.

At the same time, other interviewees pointed out that there were approximately 100,000 "either-or" billets, primarily enlisted, and that there was a need for planning and forecasting around these.

Interest was also expressed in being able to determine the needed civilian back-up and support role in various military scenarios (e.g., the 600-ship Navy or for surge capabilities and mobilization procedures). A repeated theme was the current inability to relate civilian manpower needs

to specific Navy activities (e.g., the precise number and type of civilians required for maintenance of particular ship types) based on a defensible, quantitative method. A related research topic, discussed under the productivity research area is determining what particular civilian-military relationship is most productive for different types of Naval activities.

## Existing Knowledge

The GAO 1979c stressed the need for a well-defined government policy for the most effective mix of military, civilian, and contractor personnel. Binkin 1978 sought to identify an optimal mix of military, federal civilian, and private sector workers in the defense establishment, recommended changes, and pointed out desirable avenues for further research.

Beltramo 1974 discussed cost issues related to the substitution of civilian for military personnel and recommended further civilianization. Koehler 1981 employed a billet cost model to compute Navy civilian billet costs. Blanco 1980 provided a plan for assessing the costs and benefits to the Navy of decrewing pilot ships during overhaul. Blanco and Mumm 1980 projected the impact of six specific Navy-wide decrewing scenarios on skill shortages for fleet and shore intermediate maintenance.

The Central All-Volunteer Force Task Force 1972 estimated the maximum potential civilianization of enlisted support positions in the continental United States, examined the comparative costs of civilian and military personnel in various occupational fields and examined the feasibility, desirability, and cost savings of specific contingency plans for civilianization. The Department of Defense 1969 reported on the military-civilian mix in the logistics workforce. Cason 1972 argued that trade-offs between military and civilian manpower were obscured by the fragmented process by which authorizations of future military and civilian manpower were developed for the Army. He called for the establishment of a unified process.

Science Applications, Inc. is currently studying manpower requirement determinations for the Office of the Secretary of Defense, including an examination of how the services decide between civilian and military labor.

It will recommend changes in manpower planning to increase the efficiency of the use of the civilian labor force.

There are a number of sources on manpower data. The Naval Civilian Personnel Policy Division (OP-14) publishes periodically Personnel of the Naval Shore Establishment, describing the personnel composition of the Navy shore manpower by selected demographic variables. DoD publishes monthly Civilian Manpower Statistics, providing current data on the defense establishment's civilian workforce except for the National Security Administration. DoD publishes annually Selected Manpower Statistics, providing data on both civilian and military defense manpower. OPM's Monthly Release: Federal Civilian Workforce Statistics presents updated data on the Federal government's civilian workforce and 13-month trends in employment, compensation, and turnover. The monthly data is occasionally supplemented by other periodic surveys of occupational, geographical and compensation characteristics of the Federal civilian workforce. Atwater et al. 1983a and 1983b used the Natnum model to project the labor market availability for Navy civilian professionals in the 1980's, including attention to race and sex for EEO purposes.

## C: Determine How Changes in Technology Will Change Future Position Requirements

### Background

A number of participants expressed interest in being able to predict how technological changes would impact upon job needs and job definitions. In particular, the possible impacts of changes in computer science and general information management techniques were cited. Interest was expressed in how technological trends might affect personnel functions within the next five years, as well as in longer-term "crystal-balling" by recognized experts in the field. A corollary research topic would assess potential changes in the number of employees per supervisor that new information management techniques might warrant.

## Existing Knowledge

This literature search identified few sources projecting the impact of technology on future manpower needs and job definitions. Blanco et al. 1979 analyzed technological trend variables to forecast maintenance manpower needs for new aircraft. Flack and Nichol 1980 reviewed the education and training for the ship repair industry program and are studying the Naval Integrated Storage Tracking and Retrieval System (NISTARS) to identify the effects of the new technology on people, organizational structure, jobs and management practices. This research will include an analysis of the changing role of first-level supervisors. Another NPRDC study is examining factors influencing the implementation of office technology systems in Navy laboratories.

## D: Review Currently Available Manpower Forecasting Techniques, Including Military Models and SHORSTAMPS, and Identify Those Techniques Which are Most Valid and Likely to be Accepted by Policy-makers

## Background

Research suggestions in this area indicated that some of the current forecasting techniques need updating and methodological refining. Some techniques are directed toward the active-duty Navy population only and are not transferable to civilian estimates. Some data that is available is not in a form easily understood or usable for civilian policy personnel. The R&D community sees a need for a manpower modeling formula devoted to overall Navy needs rather than to specific laboratories.

## Existing Knowledge

There is extensive literature on personnel forecasting, principally applying and attempting to improve on existing mathematical models. Hutchins and DiGialleonardo 1974 explained the Manpower Requirement and Resource Control System (MARRCS) project that supplies R&D support. It

focuses on the demand for manpower resources whereas previous efforts focused on the supply of personnel. Wedding and Hutchins 1974 compiled source information about Navy manpower planning processes prior to MARRCS. Hutchins 1974 made a recommendation on the structuring of MARRCS.

Blanco 1976 reported on the development of a test of an Input-Output model (not to be confused with the Input-Output ratios discussed under the Existing Knowledge section of Productivity Phase I.) Sorensen and Willis 1977 examined ways that organizational and workload structures influence the formulation and data analysis of manpower requirements for application in the Input-Output modeling. To test the feasibility of the Input-Output forecasting model, NPRDC organized a major data collection and empirical analysis of the fleet-shore demand workload focusing on the 11th Naval District (Bokesch and Wertz 1977, Rowe 1976, Blanco 1976b, Blanco and Rowe 1977a, Blanco and Rowe 1977b, and Whisman 1977).

Kissler 1979 documented a series of interactive computer routines for assessing the impact of changes in the fleet structure on the shore support workload, which can be translated into manpower requirements. Glover et al. 1977 described a prototype computer-assisted policy evaluation (CAPE) system to solve naval personnel assignment problems.

DiGiallenardo and Barefoot 1974 presented a technique for assessing management and information systems to permit cost-benefit analysis. Schmid and Hovey 1976 discussed the application of utility theory to developing a model for measuring the value of various distributions of Navy manpower as an alternative to the BUPERS model.

Gewirtz et al. 1974 analyzed the applicability of various manpower models developed by the Navy's Office of Civilian Manpower Management for the use of the Naval Facilities Engineering Command. Bres and Niehaus 1974 described the test of a manpower management model in a Navy industrial facility. Hudak et al. 1982 sought estimating equations to forecast manpower requirements within the Navy's base operating support sector. Mathtech 1982 described the development and design framework for categorizing

Navy and Marine Corps Manpower suitable for the construction of manpower forecasting models.

Walker 1979 reported on a modeling technique for projecting support manpower requirements as a function of workload and operational force levels. Woon 1981 described a model to forecast the supply workload for given fleet configurations, operating schedules, and maintenance man-days at shipyards, ship repair facilities, and intermediate maintenance activities.

### E: Assess Current Supervisor/Employee Ratios and Identify Appropriate Standards

Background

Study participants on the policy level saw the need to establish benchmarks for the most effective supervisor/personnel ratio, indicating how those standards should vary based on the nature of the mission and the type of personnel supervised, including contract personnel. Articulating such standards would make them more defensible in budget decisions concerning manpower requirements.

Existing Knowledge

This literature search was unable to identify sources on current supervisor/employee ratios.

## PHASE II: DEVELOP A VALID, CREDIBLE FORECASTING MODEL

This phase concentrates on the creation of a centralized model for predicting the number and types of civilian personnel needed for various Navy functions and contingencies as part of the total force.

## Background

According to many of the study participants, the ability to develop a valid forecasting model hinges upon a number of factors. A thorough study is needed of the policy and procedures now in place in the planning and predicting of manpower needs at the OPNAV level. Those policies and procedures which hamper the integration of data on the civilian workforce should be identified. Such a study should point out the changes necessary in both policy and procedure so that civilian workforce data is routinely incorporated into planning for both active duty and reserve end-strengths. In turn, the civilian side of the house must strengthen long-range planning abilities both at the individual activity level and overall. Centralized planning should directly relate the size of the active-duty Navy and the size and composition of the civilian workforce needed in a support capacity.

## Existing Knowledge

The literature on manpower forecasting cited in the Existing Knowledge section of Manpower Phase I-D is pertinent to this section. Some work on an integrated model was presented by Charnes et al. 1974, who studied the feasibility of creating a "multi-level model" by linking models for manpower and program planning.

# PHASE III: DEFINE STRATEGIES TO INTEGRATE FORECASTING INTO BUDGETARY DECISION-MAKING

This phase seeks first to document current processes for projecting manpower needs and for budget formulation and then to assess optimum strategies to relate forecasting to policy-making.

## Background

The basic issue appears to be that manpower planning, civilian personnel policy and budget formulation are accomplished in separate divisions

within OPNAV. Consequently, manpower forecasting systems, such as SHORSTAMPS, are not necessarily integrated or used as a basis for budget development and justification. Respondents at the policy level and in OSD suggested a need to evaluate the current system of planning and design a more integrated system for translating civilian manpower forecasts into defensible budgets.

Interviewees expressed a need for information about the ranges of various processes for projection that are now being used (e.g., data that might be available but is in "esoteric" mathematical formulas not readily accessible or which is used for military manpower and might be transferable to the civilian sector). Given this information, certain strategies could then be chosen and a connection established between forecasted needs and policy-level decisions about recruitment and retention strategies.

Existing Knowledge

Science Applications, Inc. is currently studying manpower requirement determination for the Office of the Secretary of Defense, including a review of the actual processes that the services use to determine manpower needs and for program planning and budgeting. The literature cited in the Existing Knowledge sections of Manpower Phase I-D and Phase II is also pertinent to this section.

## OUTCOMES

The research data gathered in the three phases (analyzing issues, developing a forecasting model, and defining strategies) could then be used to formulate both policy recommendations and policy guidance. Policy recommendations might be geared toward other divisions at the OPNAV level (e.g., OP-11, OP-12, OP-13) as well as toward those within the Navy Comptroller's office responsible for "selling" the Navy's budget to Congress. The research results could also be used to formulate policy guidance in terms of forecasting needs for both individual activities and any centralized system which might be developed.

## SUMMARY OF MANPOWER REQUIREMENTS RESEARCH

### PHASE I: ANALYZE ISSUES DETERMINING CIVILIAN PERSONNEL REQUIREMENTS

A. Determine Nature and Extent of Contracting-Out Now Occurring and Identify the Most Cost-Effective

B. Determine Current Patterns in Military Billet and Civilian Personnel Mixes and Identify Optimum Situations

C. Determine How Changes in Technology Will Change Future Position Requirements

D. Review Currently Available Manpower Forecasting Techniques, Including Military Models and SHORSTAMPS, and Identify Those Most Valid and Likely to be Accepted by Decision-Makers

E. Assess Current Supervisor/Employee Ratios and Identify Appropriate Standards

### PHASE II: DEVELOP A VALID, CREDIBLE FORECASTING MODEL

Develop a Centralized Model for Predicting the Number and Types of Civilian Personnel Needed for Various Navy Functions and Contingencies as Part of the Total Force

### PHASE III: DEFINE STRATEGIES TO INTEGRATE FORECASTING INTO BUDGETARY DECISION-MAKING

Document Current Process for Projecting Needs and for Budget Formulation and Assess Optimum Strategies to Relate Forecasting to Policy-Making

### OUTCOMES

A. Policy Recommendations To Higher Levels on Budget Formulation and Forecasted Needs

B. Policy Guidance from OP-14 on Procedures to Assess and Formulate Forecasting Needs

# RECRUITMENT

## OVERVIEW

The majority of those who responded to the interview questions expressed the view that recruitment of new personnel currently was less a concern than either the retention or productivity objectives. The exception to this was the continuing need to recruit engineers and scientists. Respondents were very interested in how best to ensure a continual flow of highly qualified technically-trained individuals into the Navy system. Although the current labor market does not present widespread difficulties in recruitment, many respondents did note that the labor market would soon change. For example, given the demographic trends in this country, the pool of 18 year olds entering the labor force will be "drying up," and the active duty military and the private sector will compete with the Federal government for these individuals. There is interest in the development of research (see Figure IV-2 on the next page) predicting changes in the labor pool that will subsequently affect recruitment in the coming decades. This also has obvious implications for concerns discussed under Manpower Requirements.

## PHASE I: ESTABLISH BASELINE MEASURES

As a prerequisite to further research, study participants noted that there were two areas to be explored in the recruitment area. These were to:

A. Develop Measures of Quality and High Performance Potential.
B. Determine Recruiting Success Rates in Key Occupational Series.

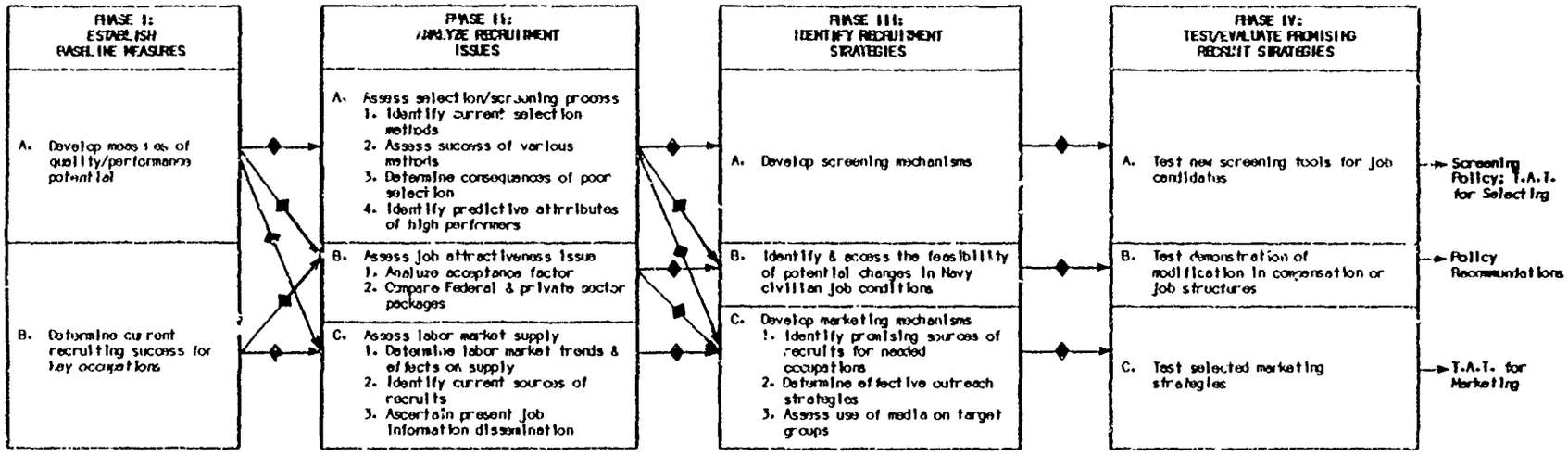
### Background

Interviewees pointed out that successful recruitment efforts require an understanding of the attributes of a "high" or "low" performer in any

FIGURE IV-2

CONVERGENCE CHART:

ARRAY OF RECRUITMENT RESEARCH




◆ Is there sufficient knowledge about the subject?

- If yes, proceed to next phase
- If no, additional research is required

job series. There is also a need to determine what most effectively identifies high performance potential, other than the "gut feelings" of an interviewer. Another prerequisite for successful recruitment is to ascertain those occupational areas Navy-wide in which recruitment efforts are already successful and those in which they are not, so as to focus strategies on key occupational areas where recruitment lags.

Existing Knowledge

This literature search found no measures of quality of recruited civilian personnel. This literature search found no measure of "success rates" in recruitment. Office of Personnel and Management (OPM) Monthly Release: Federal Civilian Workforce Statistics provides information on accession rates.

## PHASE II: ANALYZE ISSUES AFFECTING SUCCESSFUL RECRUITMENT

### A. Assess Selection and Screening Process

Background

Study participants suggested a need to:

- Identify all the current selection methods now in use;
- Assess the success of the various methods or combination of methods;
- Determine the consequences of poor selection; and
- Identify candidate attributes associated with high performance.

Individuals are now brought into the federal government workforce by a variety of avenues, including standard application forms, personal interviews, references, and written test instruments. Study participants suggested that research was needed to determine which methods were more successful with different entry levels (e.g., the mechanisms used to screen a

potential SES job candidate are not necessarily appropriate for screening for a GS-12 position). It was also felt that, because of possible legal impediments to the use of standardized tests (e.g., the Pace Exam), alternative tests should be devised. If OPM offers alternatives, they should be subjected to cost-benefit analyses. Predictive tests are needed to measure potential skill in areas such as communication abilities or supervisory management aptitude, as well as degree of commitment to a Navy career. Many interviewees emphasized research needs in the area of predicting managerial ability early in an individual's career. Conversely, there is a need to document the consequences of poor selection of employees. Do low performers tend to stay or leave a Navy career? What impact do poor performers have on their co-workers' morale and productivity? Cohort studies of a longitudinal nature are one type of possible research avenue to address these questions.

High performance individuals should also be studied to determine what attributes they possessed at the time of recruitment which might have contributed to their success. Such a study might lead to unanticipated correlations. For example, one respondent noted that in his experience, the very best and most creative computer scientists were not those trained specifically in computer science but rather in other fields, such as electronic engineering.

A number of individuals pointed out the need to re-examine the entire procedure of recruiting SES personnel and to devise new mechanisms to attract quality personnel who have already established their abilities in the private sector.

Existing Knowledge

Katzell and Barrett 1966 identified varying selection factors for first-line civilian supervisors in the Army over time and across installations. The Department of Defense 1969 discussed the recruitment of

personnel for the military's logistical support services. The Defense Manpower Commission 1976 reported on the process of recruiting physicians for the military. Stewart Analysis, Corp., under contract with the Office of the Secretary of Defense, is currently studying various processes for the recruitment of civilians for mobilization slots through interviews of personnel chiefs at 25 military installations.

The identification of high performance has been the object of various appraisal systems (see Productivity Phases II-A and III-A). OPM 1983b reported on a computer-assisted evaluation and referral system developed for the Army's centralized promotion program. Task-based job analyses combined with expert panels are used to identify qualifications appropriate across career fields of civilian personnel administration. This approach can help identify superior program planning for mobility by analysis of workforce patterns and needs, target positions, selection of program participants, training, counseling, and evaluations. The U.S. Civil Service Commission 1974a reported on a systematic plan for identifying managerial potential. The particular requirements of the plan would differ from agency to agency, but the report stressed the need for multiple measures when screening large numbers of candidates.

## B. Assess Job Attractiveness Issues

To assess the attractiveness of jobs offered in the recruitment process, research was requested which would:

- Analyze factors affecting acceptance of job offers; and
- Accurately compare Federal and private sector compensation levels.

### Background

Study participants expressed an interest in ascertaining the key variables involved in candidates accepting or refusing jobs in the Federal

sector and the relative weighting of such factors for different age and occupational groups. The suggested variables include:

- Salary range;
- Benefits (e.g. health insurance, retirement);
- Opportunities for education/training;
- Promotion opportunities;
- The image of civil service and the government;
- Nature of work experiences available; and
- Physical working conditions.

Many individuals expressed experiential knowledge of the relative importance of the variables for different age groups but pointed out that there was no valid data to document their impressions. Informants noted that a study which identified the factors that lead to refusal or acceptance of job offers would be useful. Such a study should include not only the responses of the job candidates but also the perceptions of Navy civilian managers who are themselves involved in recruitment about job refusal or acceptance.

A related research inquiry is the impact of these identified variables on retention of already employed Federal personnel. For the purposes of recruitment, knowledge of the relative importance of such variables would also contribute to developing strategies for recruitment aimed at different target audiences (e.g., emphasizing the education/training opportunities within the government for one age group and health benefits for another).

Most interviewees assumed that both competitive starting salaries and promotion opportunities were critical variables for both recruiting and retention. At the same time, many expressed scepticism about the job comparability studies available for the public and private sectors; they wanted more objective research in this area. Such comparability studies should take into account not only salary levels, but benefit packages and such intangibles as "job security." Although a number of interviewees thought that some types of federal positions were probably over-compensated (e.g.,

clerical workers) and others were under-compensated (e.g., nuclear engineers), they expressed concern that there was no valid data available to test their impressions.

Existing Knowledge

Sterling 1980 investigated factors affecting the recruitment and retention of federal civilian employees in the Army's VII Corps (overseas). NPRDC 1981 presents the results of a seven-month quantitative survey of the effects of the high-grade limitations on Navy labs. Taylor et al. 1965 studies the work environment of a military scientific laboratory and recommended changes.

McGonigal 1978a compared compensation between the DoD and the private sector by age for selected occupations. Powers 1975 reported on the productivity and compensation of civilians in the DoD's support structure and reviewed progress in ensuring that wages for employees are comparable to those in the private sector.

The GAO 1984 reported that OPM's disinclination in recent years to grant pay increases to "special rate" workers has hampered recruitment and retention of top-rated scientists and engineers. The GAO study says that starting pay for government engineers is now less than half that offered by private engineering firms. A Navy shipyard commander told the GAO that, even when new technical workers were recruited, time was lost because of the need of these workers for additional training. The Navy reportedly was unable to fill one percent of its engineering and technical positions in 1983. It was reported that it was hardest to fill positions in the field of electronics.

## C. Assess Labor Market Supply Issues

The numerous research suggestions in this category can be classified into three sub-categories:

- Determine how labor pools in various job categories may change over time as a result of demographic and educational trends;
- Identify current sources of recruits for various specialties; and
- Ascertain how desired target populations currently learn about job openings, and how recent employees learned about their jobs.

## Background

To recruit the types and numbers of civilian personnel that the Navy would like requires an assessment of the future availability of the labor pools for the various specialties. Thus, future Navy civilian workforce requirements whose forecasting is central to the Manpower Requirements Array is closely aligned with the concerns about the recruitment opportunities and constraints imposed by the future labor market. Of particular concern is the anticipated fewer numbers of 18 year olds, but of equal interest is the nature of the future skilled workforce. Research suggestions included looking at the role of colleges and universities in developing various occupational skills.

Study participants expressed interest in knowing what are now the best sources of recruits both for different specialties and Navy-wide (e.g., junior colleges, technical trade schools, the Ivy League schools).

There was also curiosity about how individuals with characteristics considered essential to the Navy's mission first learned about their Navy job possibilities and how the Navy personnel system responded to them.

## Existing Knowledge

Atwater et al. 1983a, reporting on labor market availability for Navy civilian professionals in the 1980's using the Natnum model, identified among upcoming projects a wage elasticity analysis with particular concern for the effects on the attractiveness of Navy employment given the increased need for high technology specialists and restrictions on compensation. Systems Research Applications, under contract to the Office of the Secretary of Defense, is constructing two alternative labor supply models to estimate the supply elasticity of civilian labor for the DoD with respect

to compensation for each age cohort to explain the retention of younger civilians in the DoD workforce. One model, assuming that civilians respond to short-term earnings, relates retention rates to current Federal salaries versus those in comparable private sector positions. The other model, assuming that civilians seek to maximize life-time income, relates retention to the present value of all expected Federal salary and pension payments for civilians remaining in the DoD until retirement. The two models will allow projections of the effects of alternative changes in Federal compensation on DoD civilian retention.

This literature search was unable to identify particular sources for the labor supply. The Atwater models focused on the general labor market in the immediate areas of Navy installations.

This literature search could not document how information about job openings was learned by applicants.

## PHASE III: IDENTIFY POTENTIAL STRATEGIES TO INCREASE RECRUITMENT SUCCESS

Once a thorough analysis of recruitment issues has been completed, the next logical phase would be to identify strategies which would strengthen recruitment efforts.

### A. Develop Screening Mechanisms

#### Background

Building on Phase II suggestions, one means of developing better screening is to make greater use of those mechanisms identifiable as successfully recruiting promising performers. Study participants also mentioned the need for research leading to the design of new valid tools and procedures for the screening process. At the present time there is uncertainty about the validity of various screening tools. There is concern

whether there is any correlation between the ability to complete a form 171 satisfactorily and the ability to perform the job called for. There is concern over whether interviewers are trained to recognize potential within the interview process and over how much weight to give to interviewer's perceptions. There is also concern that many good candidates may go elsewhere because the hiring procedures are generally much slower than in the private sector. The need to develop and use a replacement for the Pace exam was frequently mentioned, as was the need to analyze the potential legal ramifications of any newly devised testing tools before they can be used.

Existing Knowledge

Lau et al. 1980 studied the nature of managerial work in the public sector and sought to contribute to the development of selection and other personnel programs.

This literature search did not identify the tools for developing new screening procedures. Some actuary tools for anticipating staffing needs are detailed in the Civil Service Commission 1977 handbook for personnel workers.

This literature search did not identify extensive sources on the legal implications of various selection procedures. Personnel selections must conform to the Civil Service Commission's Uniform Guidelines on Employee Selection Procedures. Quantance 1980 examined the impact of the selection guidelines on public merit selection. Holly and Schanie 1980 wrote an interpretive review of the selection guidelines.

## B. Identify and Assess the Feasibility of Potential Changes to Navy Civilian Job Conditions

Background

Study participants noted a number of aspects of the Federal career package which, if modified, might make it more attractive to target

populations and increase recruiting success. The three aspects most often mentioned were:

- Compensation and benefits;
- Job structure;
- Career ladders.

Research efforts would be directed toward identifying what potential changes in these three aspects might improve recruiting with attention to identifying those changes which might be possible given Navy and U.S. Government requirements.

Many concerns were expressed about the present practices in those three areas. Under-compensation for managers and erosion of retirement benefits were specifically mentioned. A major interest was the impact of the recent changes in the Civil Service Retirement Act. The complex nature of the post-January 1st, 1984 interim plan and the uncertainty of what any new pension plan will look like may make a government career much less appealing to new employees. A repeated concern about job structure was the relatively low ratio of high-grade technical (as opposed to managerial) positions for engineers. In addition, the proposed cutback in GS 11-15 positions means "cutting out some of the rungs on the career ladder," as one individual noted. That may possibly make a Navy career less attractive.

Recruitment issues and strategies are much like those for retention discussed in the next section. Apparently it is assumed that whatever tends to attract people into a job tends to motivate them to keep it. This is itself a testable hypothesis for future research.

## Existing Knowledge

Sands 1973 described the application of the cost of attaining personnel requirements (CAPER) model to recruiting and personnel selection

problems to provide personnel managers with the information to minimize the estimated cost of acquiring and training specified quotas of personnel. Bres et al. 1979 reported on the development and testing of aggregate manpower and personnel models for determining recruiting requirements for large Navy shore activities.

## C. Develop Marketing Mechanisms

Purposeful recruiting was viewed by many respondents as an essential activity, but also as somewhat haphazard at present. Potential research about marketing activities to enhance recruitment fell into three different categories:

- Identify the most promising sources of recruits in high-need occupational categories;
- Determine the most effective outreach strategies; and
- Assess the impact and cost-effectiveness of alternative methods of ad designs and media usage on target populations.

### Background

It is important to locate the most promising sources for recruitment in occupations identified as "high need," such as electrical engineers and hull technicians. The most effective out-reach strategies for each of these groups can also be determined by analyzing current recruitment channels of both the government and private industry such as:

- Coop programs;
- Summer job-intern opportunities;
- High school presentations;
- On-campus recruiters; and
- Job fairs.

One related question concerns comparative effectiveness of a more centralized recruiting system as opposed to recruiting by individual activities. Another is the relative effectiveness of different recruiting techniques for the various occupational series.

Another suggested research endeavor raises questions directed at evaluating the impact of various media techniques on target groups. What promotional aids are most effective? What components of promotional aids make them effective? In what ways could the Navy improve recruiting through the media? How could costs be reduced? Would it be possible to combine military and civilian recruiting efforts?

Recruitment questions pertain not only to research on retention, but also to Equal Employment Opportunity, where research suggestions were made in terms of developing and testing recruiting strategies directed toward minorities and women.

Existing Knowledge

This literature search identified no sources on marketing mechanisms for attracting civilians into the military support services. Hanssens and Levien 1983 studied recruitment marketing in the Navy using an econometric model to evaluate the relative success of media advertising and personal selling and also the relative influence of marketing versus environmental variables in recruiting Navy servicemen.

## PHASE IV: TEST AND EVALUATION OF PROMISING RECRUITMENT STRATEGIES

Building upon Phase III suggestions, sequential research efforts could be carried out in the following areas:

- Test newly developed screening tools for job candidates;
- Test selected modification in compensation packages or job structures on a demonstration basis; and

- Test and evaluate selected marketing strategies based on research findings.

Background

Many respondents stressed the need to document the impacts of innovative techniques developed within the Navy personnel system so as to be able to justify their continuation or termination according to their relative success in achieving objectives. A number of individuals mentioned the possibility of developing demonstration models under the Civil Service Reform Act regulations.

Existing Knowledge

The specification of new screening tools, modified selection procedures, and recruitment marketing strategies must precede the development of a literature to evaluate these strategies.

## OUTCOMES

The research efforts discussed above might provide a basis for:

- Policy guidance from OP-14 to both CCPO personnel and managers on screening procedures as well as technical assistance and training on any modifications of the selection process;
- Policy recommendations to higher levels based on demonstrated impact on recruitment of changes in the compensation/benefit package and job structures; and
- Technical assistance and training on marketing mechanisms at the appropriate level (syscoms, field activity, etc.).

## SUMMARY OF RECRUITMENT RESEARCH

### PHASE I: ESTABLISH BASELINE MEASURES

A. Develop Measures of Quality/High Performance Potential

B. Determine Current Recruiting Success Rates in Key Occupational Series

### PHASE II: ANALYZE ISSUES AFFECTING SUCCESSFUL RECRUITMENT

A. Assess Selection and Screening Process

1. Identify Current Selection Methods
2. Assess Successfulness of Various Processes
3. Determine the Consequences of Poor Selection
4. Identify Candidate Attributes Associated with High Performance

B. Assess Job Attractiveness Issues

1. Analyze Factors Affecting Acceptance of Job Offers
2. Accurately Compare Federal and Private Sector Compensation Levels

C. Assess Labor Market Supply Issues

1. Determine How Labor Pools in Various Job Categories May Change Over Time as a Result of Demographic and Educational Trends
2. Identify Current Sources of Recruits for Various Specialities
3. Ascertain How Desired Target Populations Currently Learn About Job Openings, and How Recent Employees Learned About Their Jobs

### PHASE III: IDENTIFY POTENTIAL STRATEGIES TO INCREASE RECRUITMENT SUCCESS

A. Develop Screening Mechanisms

1. Identify Current Mechanisms that Successfully Select High Performers
2. Design Valid Tools and Procedures to Aid in the Screening Process
3. Analyze Legal/Discrimination Implications of Potential Tools

B. Identify and Assess the Feasibility of Potential Changes to Navy Civilian Job Conditions

C. Develop Marketing Mechanisms

1. Identify the Most Promising Sources of Recruits in High Need Occupational Areas

2. Determine the Most Effective Outreach Strategies

3. Assess the Impact and Cost-effectiveness of Alternative Ad Designs and Media Usage on Target Populations

## PHASE IV: TEST AND EVALUATE PROMISING RECRUITMENT STRATEGIES

A. Test New Screening Tools for Job Candidates

B. Test Selected Modifications in Compensation Packages or Job Structures on a Demonstration Basis

C. Test and Evaluate Selected Marketing Strategies Based on Research Findings

### OUTCOMES

A. Policy Guidance From OP 14 on Screening Procedures; Technical Assistance and Training on the Selection Process

B. Policy Recommendations to Higher Levels on Changes in Compensation and Benefit Packages and Working Conditions

C. Technical Assistance and Training on Marketing Mechanisms

# RETENTION

## OVERVIEW

This particular research area (see Figure IV-3 on the following page) was of great importance to the majority of the individuals interviewed in this study. An underlying theme was the potential and actual loss of skilled personnel, particularly in the science and engineering community, to private industry both because of non-competitive wage and benefit packages and because of the negative image of the Federal worker. Unacceptable levels of attrition of the labor force because of actual and anticipated changes in promotion opportunities, retirement age, pension plans, and health insurance were mentioned frequently. Respondents posed a number of questions which expressed curiosity about general trends in the Navy civilian population:

- Why individuals left their jobs;
- How attrition varied by job category;
- How attrition varied by career stages; and
- What sorts of employment is taken by those leaving their careers in the Navy.

The answers to these questions were seen as critical to successful retention strategies.

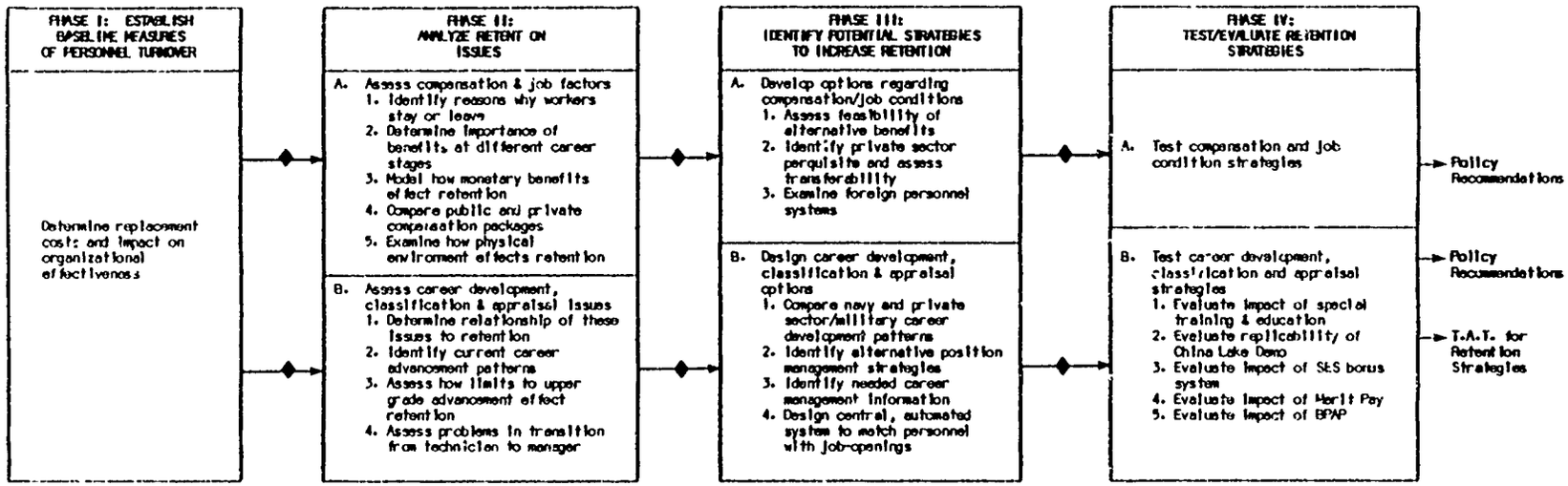
## PHASE I: ESTABLISH BASELINE MEASURES OF PERSONNEL TURNOVER

### Background

Questions posed by a number of interviewees concerned:

- Determining actual replacement costs for different job categories; and
- Ascertaining the impact of personnel turnover on organizational effectiveness.

FIGURE IV-3
CONVERGENCE CHART:
ARRAY OF RETENTION RESEARCH




◆ Is there sufficient knowledge about the subject?

- If yes, proceed to next phase
- If no, additional research is required

Measuring the replacement costs in different occupational areas and the annual number of replacements which occur on a Navy-wide basis were two research needs identified as important for policy level personnel. It was noted that this type of research has been done for certain military billets (e.g., pilots) and resulted in changes in retention incentive efforts, particularly in terms of bonuses.

Personnel turnover also would be examined in terms of the amount of time it takes to fill a position and the consequences and the impact on productivity, morale, and effort expended in training replacements.

Existing Knowledge

Flamholtz 1983 has studied the turn-over costs for scientists and engineers in Naval Material laboratories. Turnover and attrition rates for the Federal civilian workforce are documented continuously in OPM's Monthly Release: Federal Civilian Workforce Statistics.

## PHASE II: ANALYZE ISSUES AFFECTING RETENTION

The majority of respondents indicated two principal areas where research is needed to enhance retention. The first area involves compensation and working conditions, while the second focuses on the employment structure of government in general and the Navy in particular.

### A. Assess Retention Factors Related to Compensation and Job Conditions

- Identify Primary Reasons Why Employees Stay or Leave and Where They Go;
- Determine the Most Important Benefits at Different Career Stages;
- Develop an Elasticity Model for Compensation;
- Compare Public vs Private Compensation Packages;
- Examime the Impact of Physical Environment.

## Background

A number of interviewees offered hypotheses concerning individual decisions on whether to remain with the Navy civilian workforce until retirement. Interest was expressed in collecting comprehensive data on the stay/leave decision. Factors to be examined include:

- Salary;
- Benefits;
- Nature of the work available;
- Advancement opportunities;
- Working conditions;
- Image of public servant;
- Job security;
- Private sector opportunities; and
- Any other factors mentioned by existing employees.

Related research would ascertain how the weight of these factors change at different stages of employees' careers. For example, is it in fact true that entry level employees are generally not concerned with retirement benefits or retirement age regulations? Does the importance of flex-time vary according to employees' age or seniority. The answer to such questions would contribute to developing both retention and recruitment strategies.

Of interest also was whether people left for other government agencies or the private sector and what types of agencies or industries are attracting away Navy employees. An additional query was when in the career cycle individuals are more likely to leave, at what grade and salary levels, and at what age.

Several interviewees in program management suggested that the nature of the work available to technical personnel may be as significant as compensation as a factor affecting retention. Concern was expressed that many current jobs may not be structured so as to meet the expectations of young scientists, engineers and computer specialists.

It was suggested that a model be developed which could predict the relationship between the monetary benefits of particular positions and the rate of retention. Such a model would suggest the amount of elasticity inherent in certain pay grades.

Another component to such studies would be an "accurate" comparison of public and private sector compensation packages, including not only wages but benefits and other elements such as physical working environments and compensation for relocations. Interviewees mentioned that wage comparisons are done periodically but many expressed the view that such studies are frequently biased because of political considerations. A few surmised that some categories of Federal workers were overpaid while some were underpaid, but noted that there was little "credible" data to back this up.

A number of interviewees suggested a study documenting the presumed negative impact of the physical environment on morale and hence retention. Such factors as amount of office space, privacy, age of buildings, decor, lack of nearby support services (such as grocery stores, dry cleaners, etc.) were suggested as possible "disincentives." The factors raised mostly concerned the white-collar environment, rather than that of the wage-grade worker in Navy industrial activities. This may reflect the immediate concerns of the participants in the interviews, none of whom were wage-grade employees. These factors were mentioned more frequently by individuals who were interviewed in the Navy Annex than by those employed in Crystal City, but were expressed as being widespread conditions for many within the Navy's workforce.

## Existing Knowledge

Curry 1974, in an attitude survey of Navy civilians, used factor analysis and regression equations to link employee turnover to selected predictor variables. McGonigal 1977 attempted to provide reliable baseline data on civilian workforce attrition levels throughout the DoD and the reasons for leaving in terms of the relation of turnover to selected predictor varaibles. French 1982 used a personnel-environment misfit model in which

retirement among Navy enlisted men was found to relate to 29 variables. McGonigal 1978b conducted a turnover study focused on DoD civilian separation characteristics of DoD GS 11-18 employees. Sterling 1980 investigated factors related to the retention and recruitment of career Federal employees based on a survey of various aspects of federal civilian life in Army's VII Corps overseas. Attrition due to alcoholism among Air Force civilians was touched on by Manley et al. 1979. The DoD 1969 reported on retention of manpower for defense logistics.

Withington 1981 reported on the Federal wage system in the period 1973-1979. OPM's Monthly Release: Federal Civilian Workforce Statistics provides up-to-date information on the federal payroll.

The literature suggests that there are problems of inadequate compensation within the Federal civilian workforce, particularly for the scientists and engineers and top level management. Patton 1974 dealt with government pay disincentives. GAO 1980c reported on the worsening compression of Federal executive pay. Andronicos 1981 outlined problems in the DoD with attrition of civilian executives due to the pay cap. Concern with the DoD civilian scientists and engineers led to the Glass 1969 examination of compensation for these technical personnel. Coursen 1979 studied the composition of the DoD's much larger blue-collar workforce with emphasis on the pay determination system as well as manpower costs. In the mid-1970's the DoD Manpower Resources Division reported on the productivity and compensation of civilians in the DoD's support services (Powers 1975).

The GAO 1981d examined issues of compensation of the Federal government's civilian workforce in light of the philosophy behind the Civil Service Reform Act. The GAO 1979e judged as unfounded complaints that the wages for Federal blue-collar employees violated the law, but nevertheless recommended legislative and administrative reforms for the compensation system. Compensation is considered in the Baker 1977 study of comparative research on organizational and behavioral research in the integrated military-civilian service workplace. Binkin et al. 1978 covered the

economics of the defense establishment's civilian workforce. Compensation was among the issues considered at the Western Forum conference on Federal productivity and the quality of working life (OPM 1981f). Kosiowski 1981 cited the compensation issue, particularly the pay cap on GS employees, as one of the long-range research needs for the Navy's civilian personnel management. The GAO 1984 reported that the government is losing some of its top-rated scientists and engineers because of restrictions on their pay. The study focused on the government's "special rate" program for workers who are paid over the regular Civil Service pay scale for their grade level. However, more often than not, OPM has declined to give pay raises to these "special rate" workers in the past few years. The GAO says that the starting pay for government engineers is less than half that offered by private engineering firms. The DoD has complained of serious difficulties in retaining their technical personnel. The GAO said that the high turnover among technicians has hampered Navy shipyard work.

Atwater et al. 1983a, reporting on labor market availability for Navy civilian professionals in the 1980's using the Natnum model. They also identified among upcoming projects a wage elasticity analysis with particular concern for the effects on the attractiveness of Navy employment given the increased need for high technology people and restrictions on compensation. Systems Research Applications, under contract to the Office of the Secretary of Defense, is constructing two alternative labor supply models to estimate the supply elasticity of civilian labor for the DoD with respect to compensation for each age cohort. This is intended to explain the retention rates of younger civilians in the DoD workforce. One model, assuming that civilians respond to short-term earnings, relates retention rates to current federal salaries versus those in comparable private sector positions. The other model, assuming that civilians seek to maximize lifetime income, relates retention to the present value of all expected Federal salary and pension payments for civilians remaining in the DoD until retirement. The two models will allow projections of the effects of alternative changes in Federal compensation on DoD civilian retention.

McGonigal 1978a compared the relative pay within the DoD and the private sector for selected occupations. Powers 1975 reported on the productivity and compensation of civilians in the DoD's support structure and reviewed progress in ensuring that wages for employees are comparable to those in the private sector.

## B: Assess Career Development, Classification and Appraisal Issues

- Determine the relationship between classification, appraisal, and promotion results and retention;
- Identify current career advancement patterns for selected job series;
- Assess how current and projected constraints to advancement to upper grades affect retention; and
- Identify current patterns and assess problems in the transition from technical to management roles.

### Background

Although compensation was noted repeatedly as a major variable influencing retention, there were a number of other elements in the Federal work system which interviewees suggested should be analyzed for their impact on employees decisions to remain in their jobs. Many of these issues are related to compensation (e.g., promotion), and could effect productivity as well as retention. As these issues affect morale, they are also pertinent to productivity.

The classification system was pointed out by many respondents as an element of the Federal system which should be closely examined for possible re-design. Perhaps drawing upon private industry models, the classification system could be made simpler, easier to understand, and cheaper to administer. In many cases, the current system is not perceived as directly related to appraisal and promotion. It was seen by some as too general, by others as too specific, but overall it was not seen as descriptive of actual job content.

Another element of the Navy system which was suggested as a research area was current career advancement patterns. Data is needed on the backgrounds of entrants, how they are promoted, and when promotions are likely to occur for both WG and GS/GM employees for various career fields. Comparisons could be made of Navy civilians and their private sector equivalents (e.g., Navy electrical engineers compared with those employeed by G.E. or other firms) for differential development patterns in terms of both time in positions and different levels of responsibility at various career stages.

A frequently mentioned source of concern and area of need for research on impact on organizational objectives was the loss of trained individuals because of systematically imposed career constraints. At the present time, it is hypothesized that there is a severe loss of skilled engineers Navy-wide between grades 12 and 13, because of grade/ceiling point restrictions and other factors. Respondents wanted to how cutting the number of grade 11-15 positions available would effect both individuals who have already achieved those grades and those aspiring to promotion into those grades. What is the impact on retention of the Navy's career ladder having "missing career rungs," as one respondent termed it? Will individuals stay in the workforce until they actually arrive at such barriers or do they make decisions earlier based upon anticipated restraints at higher levels? There is concern that the probable downgrading of GS 11-15 positions will affect promotions. There will be greater competition for fewer positions. This could potentially result in a large bulge of lower grade individuals who are bottlenecked in their career advancement. This could cause a large dropout rate as people feel that they have come to the end of their career. Furthermore, if advancement to higher grade GS positions was no longer available, other sources of compensation and reward would have to be found to substitute for the lessened chance of advancement.

One particular research strategy was to focus on certain transition points in career development. The current system, according to interviewees, emphasizes a change-over from technically-oriented work to a management role with concomitant grade and salary increases. At the same time,

those selected for advancement are often those who are technically superior while their management skills are untested. This may be counter-productive for the individual and the organization. Other research questions ask: Do individuals have sufficient knowledge of the career patterns and job requirements within the Navy system to make "informed choices" about their own career strategies? How can the organization better predict managerial or supervisory skills to pre-select individuals suitable for training and development? This research would link closely with issues raised in Productivity Phase II-B, which seeks to identify those knowledge, skills and abilities needed for supervisors and managers, but the emphasis here is on examining what the current patterns and problems are in such transition areas and the possible impact on retention.

Existing Knowledge

Although this literature search found no precise measures of the relationship, career opportunites could affect retention as well as the on-the-job motivation discussed in the Existing Knowledge sections of Productivity. Pertinent literature is identified in Retention Phase III-B's discussion of alternative career systems.

The literature on civilian-military tensions, cited in the Existing Knowledge section of Productivity Phase III-C, is relevant to conditions affecting retention of civilians. Wermuth 1979 argues that the strategy of maintaining adequate manpower through greater reliance on civilians must overcome established military structures that tend to relegate civilians to second-class status.

This literature search indicates a research gap in analysis of advancement patterns and career problems with managerial roles.

## PHASE III: IDENTIFY POTENTIAL STRATEGIES TO INCREASE RETENTION

Drawing on research findings from Phase II, further research endeavors could be directed toward identifying options to increase retention rates for key personnel and toward assessing the feasibility of these options.

## A. Develop Options to Increase the Attractiveness of Compensation Packages and Job Conditions

Background

A number of interviewees pointed out that the present system of identical benefits for all Federal employees may be less effective in retaining people than a stratified system. There is interest in developing a system that varies by grade level and career stage in terms of health benefits, insurance, and pension systems. For example, free annual physical exams might become a part of a highly-valued benefit package for SES-level employees.

Study participants expressed interest in identifying the range of perquisites which are now offered in some areas of private industry (such as the Fortune 500 companies) and assessing the possibility of applying them to the public sector. Some of the perks mentioned in this context included:

- Flex-time options;
- Child care facilities;
- Recreation or athletic club memberships;
- First-class airline travel; and
- Relocation assistance (including home purchase, equity funds).

Investigating the present practices of a select group of private businesses should be conducted with an eye to their possible application to the Federal sector. Such research might also bring to light other changes in job structures and working conditions likely to increase retention.

A corollary research suggestion involved studying foreign personnel systems in order to identify "promising practices" which might be incorporated into the Navy structure, although Japanese management techniques have attracted widespread interest in American industry in the last decade, it

was suggested that other foreign systems, and particularly other government systems, could be examined for cross-culturally transferable techniques.

## Existing Knowledge

Following up on the Senior Executive Association's warnings to Congress about the detrimental effects of the pay cap, Andronicos 1981 called for the lifting of the pay ceiling. The GAO 1979a called for the establishment of an independent compensation board free of political pressures to evaluate the system of compensation within the military and to propose legislation to Congress.

Gilliam et al. 1980 of General Research Corporation examined objectives and supporting strategies for the management of the Federal blue-collar work force. The General Research Corporation, under contract to the Office of the Secretary of Defense, is studying alternative incentive programs, reviewing available incentive programs in the private sector, state and local government, as well as several different incentive plans launched by DoD.

The flex-time strategies were extensively evaluated with particular attention to their impact on productivity as discussed in the Existing Knowledge section of Productivity Phase III-B. The OPM 1982a report on alternative work schedule experiments suggested that some versions of flex-time contributes to reducing attrition in the workforce.

This literature search was unable to locate information on the probable impact on retention of other perks.

This literature search did not have the resources to seek out sources on foreign personnel systems, although Willian Ouichi's work for the Office of Naval Research on Japanese management techniques was mentioned by a study participant.

## B. Design Career Development, Classification and Appraisal Options

Background

Interviewees pointed out that career development for many Navy civilians is essentially "individually managed" and has no clearly defined paths as do the "centrally managed" military careers. If there are identifiable career development patterns, research might be undertaken to compare those Navy civilian occupations with similar occupations within private industry and in the active-duty military. Such comparisons might contribute to the design of more clearly defined and visible career paths.

It might also be possible to identify alternative position management strategies to create more challenging jobs within those career paths and reduce the number of those jobs considered vacuous or redundant by both the position occupants and managers.

Identifying the information needs of personnel for career management strategies and designing a centralized automated system for matching the skills of current personnel with job openings Navy-wide were two further research suggestions.

Many individuals pointed out the need to design performance appraisal systems which are more directly tied into actual job content. It was also expressed that the determination of standards for various positions within Navy activities by which to measure various individuals' on-the-job performances was important. Dissatisfaction with the current appraisal systems now in effect for both the SES and GM levels was almost universally expressed by study participants. There was an expressed need to evaluate the impact of current systems upon both supervisors and employees and to design and test reasonable alternatives.

## Existing Knowledge

This literature search indicated that there are research gaps in terms of comparing Navy civilian career patterns with those in the private sector, position management strategies, and the identification of career information needs.

OPM 1979a identified major areas of concern for upward mobility program planning and various types of job mobility. Gilbert and Sauter 1979 reported on the Federal Executive Institute's executive development program. OPM 1976b presented an overview of the Federal Executive Development Program's assessment center. Pyle 1979 evaluated the impact of personnel policies on mid-career changes of mid-level Army civilians. W.J. Hurley et al. are preparing for publication by the Center for Naval Analyses a study of career development of civilian scientists and engineers in the Naval Material Command.

Hall 1976 reported on an upward mobility assessment center developed by the Civil Service Commission for selecting lower grade employees for job advancement. OPM 1983 reported on a computer-assisted evaluation and referral system developed for the Army's centralized promotion program. Githens and Elster 1978 analyzed the respective administrative systems for promotion of Navy officers and civilian employees. Albanese et al. 1977 described a promotions policy model's application of two Navy laboratories.

Githens and Elster 1978 also examined the implications of alternative systems for performance evaluation. Creighton et al. 1973 reported on the design of personnel development and evaluation systems as a Navy demonstration project. The GAO 1980b examined the advantages of the Automated Career Management System, a computer-based civilian personnel inventory, appraisal, and referral system and it recommended improvements in the system's effectiveness.

Babcock and Merriwether 1981 reviewed the China Lake Demonstration, concentrating on reactions to the more flexible pay and classification system.

Lau et al. 1980 studied the content of managerial work in the public sector as a step toward developing effective selection, development, and appraisal programs. Toedt and Ratliff 1978, after identifying problems with the existing Air Force civilian appraisal program, outlined a research plan to provide a new evaluating system.

## PHASE IV: TEST AND EVALUATE SPECIFIC STRATEGIES TO INCREASE RETENTION

Tests and evaluation of strategies to increase retention fall under one of two basic categories:

A. Test Compensation and Job Condition Strategies; and

B. Test Career Development, Classification and Performance Appraisal Strategies.

### Background

Following through on research proposed in Phase III of the Retention Research Array, a model policy could be field-tested on a selective basis to determine how various strategies affect retention and Navy readiness. The cost-effectiveness of any changes could be compared with the baseline data gathered in Phase I. The evaluation component could be geared toward productivity issues as well as retention in many instances. Some of the new strategies to be tested would include:

- Impact of graduated benefit system;
- Introduction of non-monetary perks, such as training programs;
- Replication of China Lake Demonstration Project in other Naval activities;

- Changes to the SES bonus system;
- Impact of Merit Pay changes; and
- Impact of Basic Performance Appraisal Program changes.

New strategies for disseminating information about employment opportunities and career management could also be field-tested on a sample basis and evaluated in terms of increased retention of key personnel.

Existing Knowledge

This literature search found that although models have been devised to attempt to estimate the impact of compensation levels on retention, no documentation was available on the impact of particular compensation packages. The impact of the Merit Pay system on productivity has been documented, as cited in the Existing Knowledge section of Productivity Phase IV, but no measures were found of their impact on retention.

This literature search indicates that there is a research gap in testing the impact of career advancement options on retention.

## OUTCOMES

Data from retention research would form the basis for policy guidance from OP-14 based on demonstration models suggested above, as well as policy recommendations to OPM or elsewhere based on documented impact statements. In addition, it would be possible to develop technical assistance and training materials in the area of retention strategies based on the research results.

## SUMMARY OF RETENTION RESEARCH

### PHASE I: ESTABLISH BASELINE MEASURES OF PERSONNEL TURNOVER

Determine Replacement Costs and Impact on Organizational Effectiveness

### PHASE II: ANALYZE ISSUES AFFECTING RETENTION

A. Assess Factors Related to Compensation and Job Conditions

1. Identify Primary Reasons Why Employees Stay or Leave and Where They Go
2. Determine Most Important Benefits at Different Career Stages
3. Develop a Model of the Relationship Between Monetary Benefits and Retention and Determine Elasticity
4. Accurately Compare Public and Private Sector Compensation Packages
5. Examine the Impact of Physical Environments on Morale and Retention

B. Assess Career Development, Classification and Appraisal Issues

1. Determine the Relationship Between Classification, Appraisal, and Promotion Results and Retention
2. Identify Current Career Advancement Patterns for Selected Job Series
3. Assess How Current and Projected Constraints to Advancement to Upper Grades Affects Retention
4. Identify Current Patterns and Assess Problems in the Transition From Technical to Management Roles

### PHASE III: IDENTIFY POTENTIAL STRATEGIES TO INCREASE RETENTION

A. Develop Options to Increase the Attractiveness of Compensation Packages and Job Conditions

1. Define and Assess the Feasibility of Alternative Benefits Systems That Vary by Level and Career Stage

2. Identify Non-monetary Perquisites Offered By Private Industry and Assess Transferability

3. Examine Foreign Personnel Systems and Identify Promising Practices

B. Design Career Development, Classification, and Appraisal Options

1. Compare Navy Civilian Career Development Patterns with Those for Similar Workers in Private Industry and in the Military and Design Strategies to Create More Clearly Defined and Visible Career Paths

2. Identify Alternative Position Management Strategies to Create More Challenging Jobs Within Career Paths

3. Identify the Career Management Information Needs of Civilian Personnel

4. Design a Centralized Automated System For Matching Skills of Current Personnel with Job Openings

5. Design Performance Appraisal Systems That are More Directly Job Related and Tied to Compensation - see Karten Use of Standards

**PHASE IV: TEST/EVALUATE SPECIFIC STRATEGIES TO INCREASE RETENTION**

A. Test Compensation and Job Conditions Strategies

B. Test Career Development, Classification and Performance Appraisal Strategies

1. Evaluate the Impact of Advanced Education and Special Training Programs on Retention

2. Test the Replicability of the China Lake Demo and Evaluate the Impact on Retention

3. Evaluate the Impact of the SES Bonus System on Retention

4. Evaluate the Impact of Merit Pay on Retention

5. Evaluate the Impact of the Basic Performance Appraisal Program

## OUTCOMES

A. Policy Guidance From OP-14 on Demonstration Models to Increase Retention; Policy recommendations Concerning Flex Time

B. Policy Recommendations Based on Documented Impact Statements; Technical Assistance and Training on Retention Strategies

# PRODUCTIVITY

## OVERVIEW

Of the five objectives which study participants responded to in the interviews, productivity concerns received the most attention. A rich array of potential research topics falls under this area. In some instances, productivity research issues overlap with retention issues. The types of research suggestions in the Productivity Array (see Figure IV-4 on the following page) are extremely heterogeneous, ranging from "global" concerns, such as morale and motivation, to highly Navy-specific concerns, such as ship maintenance downtime. Many research ideas involve issues of management: the pre-selection and training of managers, the impact on productivity of managerial style, and organizational climates or cultures.

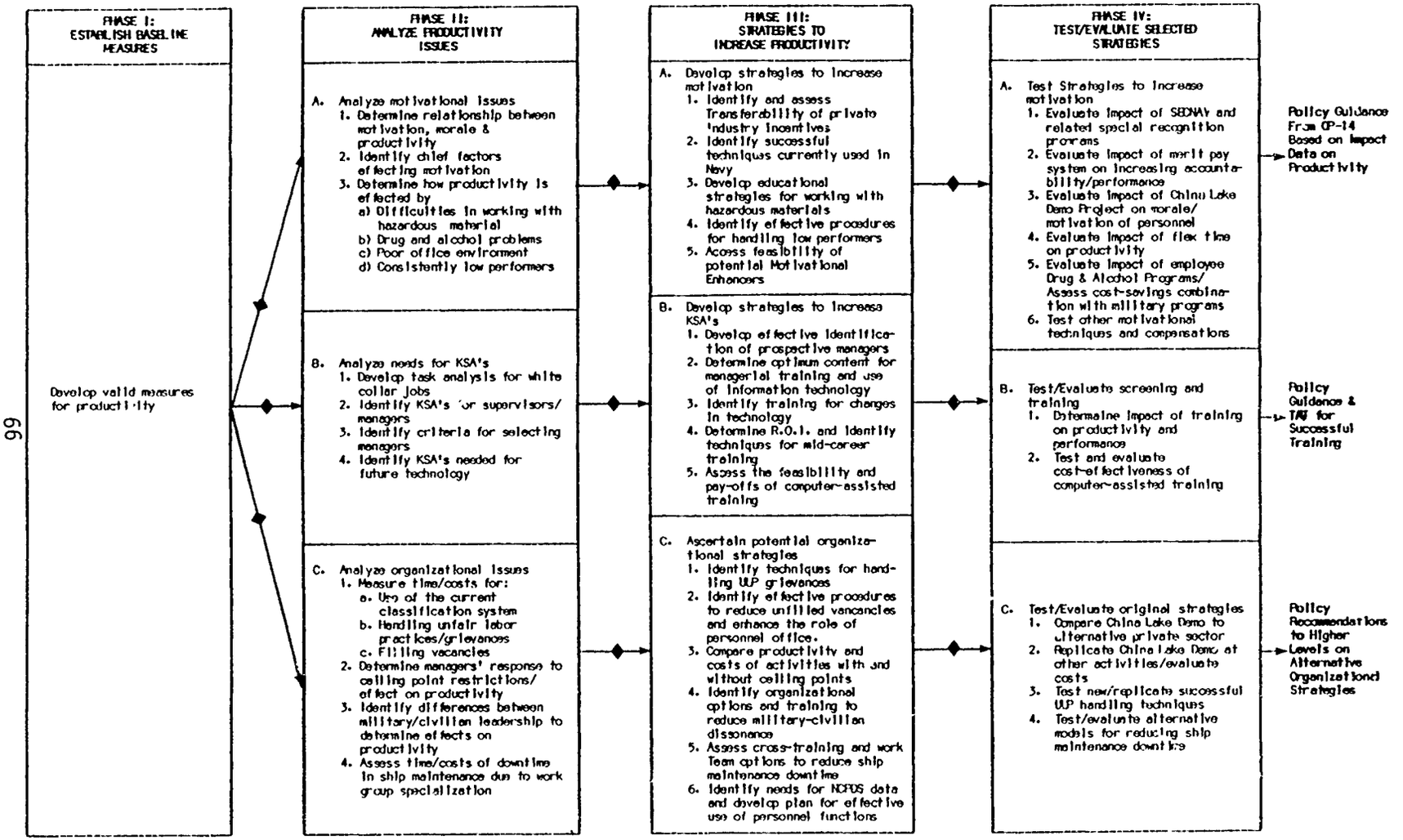
## PHASE I: ESTABLISH BASELINE MEASURES

This phase focuses on the development of valid measures of productivity.

### Background

Although a great deal of research time and effort have been devoted to productivity issues within the Navy specifically and the Federal government generally, many respondents pointed out that valid measures for productivity have yet to be fully established throughout the Navy. Civilian personnel are engaged in a wide variety of tasks, some of which are more amenable to measurement than others. For example, ascertaining productivity levels for a NARF (Naval Air Rework Facility) is very different from measuring the output of a Research and Development laboratory or a Consolidated Civilian Personnel Office (CCPO). Similarly, while extensive job analyses have been conducted for some segments of the Navy's civilian personnel population, other occupational series, particularly those in the white-collar categories, have not been addressed. Thus, productivity measures for both job

FIGURE IV-4
CONVERGENCE CHART:
ARRAY OF PRODUCTIVITY RESEARCH




♦ Is there sufficient knowledge about the subject?

- If yes, proceed to next phase
- If no, additional research is required

positions and organizations are seen as being at a rudimentary stage of development.

## Existing Knowledge

The Civil Service Reform Act of 1978 identified productivity as a major objective of the Federal government. Subsequently, the newly established OPM was given a broad mandate to promote productivity. A systematic campaign to improve productivity within the Federal sector requires the utilization of valid measures of productivity to assist in the identification of unsatisfactory performance, the formulation of strategies to boost productivity, and the documentation of successes in productivity improvements. Mark 1979 considered measurement issues for Federal productivity.

OPM has addressed the methodology of constructing measures of Federal productivity in a series of annual summaries and reports on the productivity data of successive fiscal years. Reporting on the data for FY 1978, OPM 1980c defined productivity as embracing efficiency, effectiveness, quality, and reponsiveness.

Aware of the methodological problems, OPM 1980c characterized the current methodology of Federal productivity measurement as "evolving." OPM identified the conventional approach to productivity measurement as the computation of ratios of output to input. In the Federal sector, input and output values frequently must be assigned by non-market judgments. The OPM 1981c's guidance to Federal managers for improving productivity recommended the establishment of input-output ratios subsequent to careful definitions of particular elements of productivity or performance for which measurements are sought.

OPM 1981d identified problems with the use of the input-output ratios to measure aggregate productivity. The Merit System Protection Board 1982 expressed concern with other aspects of government productivity, including

effectiveness (in meeting given objectives), responsiveness (to public demands for services) promptness, courtesy to the public, avoidance of mistakes, and an undefined "quality" of services.

Gollub and Hatry 1981 discussed the problems with the input-output measures of aggregate Federal productivity in their study of the feasibility and meaningfulness of comparing Federal and private sector productivity. Because of the problems with the aggregate measures, few Federal-private comparisons are available except at the more "disaggregate" levels (of firm or agency). Such comparisons have been made by the Bureau of Labor Standards, trade and industry associations, academic researchers, and private research firms. Gollub and Hatry 1981 proposed the acquisition of data on absolute levels of production, the monitoring of key productivity factors (such as worker education, worker experience, and equipment condition), and the regular comparison of Federal-private productivity for selected activities. Some productivity differences between the public and private sectors were identified by the National Center for Productivity and Quality of Working Life in 1978.

This search of the literature found that measures of the productivity in the performance of specific tasks are applied throughout the Federal sector to identify particular productivity problems requiring corrective strategies. The review of productivity measurement practices within the Federal government by OPM 1980d found a wide variety of methods for "keeping score" on particular activities. These methods range from simple work measurements to systems for integrating a variety of factors such as personnel, budget, program performance, and employee performance appraisals.

OPM 1980b assessed the productivity of operating personnel offices through random sampling of work activities that measured time spent in various activities and the unit labor costs associated with those activities.

This produced indices of productivity that were valid at the office level of aggregation and offered a methodology for measuring efficiency in labor time that is transferable to other such administrative services. The Joint Financial Improvement Program 1981 reported on its efforts to measure productivity in accounting and financial offices within four distinct Federal agencies. OPM 1982b set a long-range research agenda for measuring productivity with priority given to organizational structure, managerial supervision, applied technology, work motivations, and human resources planning and development.

The Defense Department employs myriad measures of effectiveness of various elements of its operations for limited purposes, such as enhancing the performance of particular tasks. Since 1965 for example, DIMES (Department of Defense Integrated Management System) has employed expert panels to set performance standards against which to compare actual performance. Limited to particular applications is the Air Force's organizational assessment package discussed by Hendrix and Halverson 1979 and the Air Force's senior executive appraisal system discussed by Guerrieri 1981. Goode 1981 focused on the special application of measuring the productivity of "thinkers" in the Navy. Performance appraisal has received considerable attention in professional journals. Hyde and Cascio 1982 edited a Symposium on Performance Appraisal in Public Personnel Administration. This work measurement approach is also discussed in Edwards 1983, Ralph 1980, and Holley 1978, among others.

Such work measurement systems have been subjected to criticism. Reviewing DIMES, the GAO 1976 found weaknesses in the work measurement program for which it proposed steps for improvements. Thayer 1981 charged that the performance appraisal system established in the wake of the Civil Service Reform Act depends on "impossible and indefensible appraisal."

An extensive literature search on organizational effectiveness by Campbell et al. 1974 reviewed existing techniques to measure effectiveness useful for further research for the Navy. The DoD 1977 study reflected the

concern of the Department of Defense with the standardization of work measurements. The GAO 1981 report found serious problems with the work measurement program within the DoD and cited proposals for improving the system. NPRDC is currently studying blue-collar workers at a NARF to develop a performance management system by integrating work measurement, performance feedback and goal-setting, performance appraisal, and monetary incentives.

Problems of constructing valid measures persist. One of the impediments to productivity cited at the 1978 conference on "Productivity and Work Motivation in the Navy and the Military Services" was the lack of fully effective ways to measure productivity (Broedling and Penn 1978; Nebecker et al. 1978).

## PHASE II: ANALYZE ISSUES AFFECTING PRODUCTIVITY

Potential research topics on productivity issues can be classified into three separate clusters:

- Motivation;
- Knowledge, skills, and abilities; and
- Organizational factors.

### A. Motivation

#### Background

In the motivation cluster, interviewees suggested investigation of relationships among employee motivation, morale and productivity. Such research should ascertain what factors actually motivate people's job performance. The research should assess whether a "punishment" or a "reward" system is more effective. Further questions would address how motivation differs by age, occupation, or other factors.

A closely related research suggestion was to identify the most important motivating or inhibiting factors for different personnel categories within the Navy's personnel system. Many such factors overlap with those suggested for both retention and recruitment issues.

Of these factors, the one most frequently mentioned concerned compensation and benefits. Of particular interest was research into the effects of the Merit Pay system on morale and hence on productivity. It was hypothezized that Merit Pay, rather than increasing morale, served to decrease it because of the "quota" system, the perceived arbitrary nature of decisions, and the broadness of the categories of performance used to evaluate performance.

Other factors to be studied for their effect on productivity included:

- Advancement prospects;
- Flex-time; and
- The "image" of Federal employees.

Additionally, it was suggested that a study of managerial styles and their respective impacts on productivity would be useful. Such a study would not seek to ascertain what makes a "good" manager in the abstract, but rather it would seek to identify managerial styles that are most appropriate for the different types of organizations and activities to which they are applicable. The effects of different managerial styles should be measured.

It was also suggested that information was needed on the possible debilitating effects on productivity of specific problems, such as:

- Fear of working with hazardous materials;
- Drug and alcohol abuse;
- Crowded and shabby office environments; and
- Continuing presence of recognized low performers.

## Existing Knowledge

The Office of Naval Research sponsored a conference on "Productivity Programs and Research in U.S. Government Agencies" (King 1983) and the relationship between productivity and work motivation in the military service was discussed at a conference sponsored by NPRDC and the Office of Civilian Personnel (Broedling and Penn 1978). Lack of sufficient means to reward employees for superior performance was cited by conferees as one of the major impediments to productivity. Broedling et al. 1980 cited reports that low pay and an unfavorable public image of government employment adversely affected worker attitudes and productivity at a Navy industrial facility. GAO 1980c reported on the worsening compression of Federal executive pay. Withington 1981 reported on the Federal wage system in the period 1973-1979. Concern with DoD civilian scientists and engineers led to the Glass 1969 examination of compensation for these technical personnel. Coursen 1979 studied the composition of the DoD's much larger blue-collar workforce with emphasis on the pay determination systems as well as manpower costs. In the mid-1970's the DoD Manpower Resources Division reported on the productivity and compensation of civilians in the DoD's support services (Powers 1975). The GAO 1979a called for the establishment of an independent compensation board free of political pressures to evaluate the system of compensation within the military and to propose legislation to Congress. The GAO 1981d examined issues of compensation of the Federal government's civilian workforce in light of the philosophy behind the Civil Service Reform Act. The GAO 1979e recommended legislative and administrative reforms for the compensation system. McGonigal 1978a compared the relative pay within the DoD and the private sector for selected occupations. Compensation was among the issues considered at the Western Forum conference on Federal productivity and the quality of working life (OPM 1981f). Koslowski 1981 cited the compensation issue, particularly the pay cap on GS employees, as one of the long range research needs for the Navy's civilian personnel management. The GAO 1984 reported that productivity was impeded in Naval industrial facilities because pay raise limitations for "special rate' personnel were hampering recruitment and retention of top-rated technical personnel.

The Merit Pay system was devised to provide a means to give managers discretion to reward superior performance as an incentive to improved productivity. Dockstader et al. 1980 presented the behavioral principles of incentive management for enhancing productivity. The Rysberg 1981 motivational analysis dealt with the issue of whether monetary bonuses can both motivate and reward employees in a merit pay system and what alternatives are available when money is an insufficient motivator. Clark 1983, in an attitudinal study, addressed the issue of the relative lack of incentive programs in government. Broedling et al. 1980 reported that the implementation of performance awards at a Navy industrial facility were frustrated by burdensome requirements for documentation and clearance through higher level channels.

Nigro 1982 reported on the considerable concern within the civil service about the applicability of performance appraisal to merit pay. Ingle 1982 found connections between personnel and program assessment processes.

As a non-monetary means of satisfying employees' personal needs, considerable attention has been given to arranging alternative work schedules to the traditional five-day regular hours standard. The GAO 1977 recommended that Congress pass legislation to facilitate alternative work schedules or "flex-time" by overriding established provisions for overtime pay and certain traditional definitions of unfair labor practices.

Although job security has traditionally been a major attribute of the civil service, concern with career advancement is obviously linked to morale and motivation. Githens and Elster 1978 analyzed the respective administrative systems for promotion of Navy officers and civilian employees and attention was given to the implications of alternative systems for performance evaluation. Pyle 1979 evaluated how personnel policies effect mid-career changes and motivation of mid-level Army civilians. W. J. Hurley et al. are producing a forthcoming publication for the Center for Naval Analyses on the career development of civilian scientists and engineers in the Naval Material Command.

Caldwell 1978 discussed the growing interest in improving morale and motivating employees by loosening the rigidity of organizational work structures and by involving the employees more in their agencies' goal setting and work planning. Broedling 1974 identified a link between an individual's perception of having control of his own environment and superior performance. Nebeker and Moy 1977 discussed the theoretical implications of expectancy theory as it operates on work performance. Ilgen et al. 1980a proposed methods for evaluating the variables suggested by expectancy theory.

Another motivational issue is the impact of managerial styles. Gabris and Giles 1980 presented a recent discussion of the issue of a link between employee performance and the perceptions of management styles. Broedling 1977 surveyed the perceived leadership techniques among a sample of Navy civilian and military managers. Managerial variables are among the factors examined as effecting Navy civilian employee perceptions of organizational effectiveness in the study by Riedel et al. 1980.

Nebeker et al. 1975 found that simply providing workers information feedback about their work affects their subsequent performance in an experimental setting. This is one function of performance appraisal to be discussed under Productivity Phase III-A.

Few sources were identified in terms of specific motivational problems. Perhaps the biggest area of concern in the field of employee effectiveness on the job is the abuse of alcohol and drugs. Manley et al. 1979 and 1980b attempted to assess the degree of alcohol-related problems among Air Force civilian employees and produced related information about job satisfaction, work involvement, and stress. Because of the high costs imposed on employee effectiveness of alcohol and drug abuse, researchers will want to draw on information about these problems in the workforce and society generally and pursue further inquiry about these problems within the Navy's civilian workforce.

This literature search did not identify sources on the problems of hazardous wastes and personnel problems with handling them. These issues

involve certain technical considerations, labor relations issues, as well as general concerns with occupational health and safety. Such problems will require further research in their application to the Navy's civilian workforce.

This literature search located little information on the debilitating effects of certain workplace environments. The quality of working life as it relates to Federal productivity was addressed in the Western Forum co-sponsored by the Office of Personnel Management and the Sacramento A' .o-gistics Center (OPM 1981f). Taylor et al. 1965 studied the work environment in a scientific laboratory of the defense establishment.

## B. Knowledge, Skills, and Abilities

### Background

In the cluster of research suggestions about knowledge, skills, and abilities, there was a very general informational need to know what people actually do in various Navy activities. It was suggested that highly specific ethnographies of individual Naval activities could be developed and used as case studies for the purpose of management training and recruitment.

Related to this is the need to develop a timely and effective methodological structure for development of task analyses of white-collar jobs. A streamlined and less time-consuming version of what was done for wage grade workers might be accomplished. This could be based on research to identify the basic tools which are necessary for many jobs. The descriptions of the basics could then be "fine-tuned" for the descriptions of specific jobs.

Some participants further suggested that productivity standards be developed for personnelists, setting minimum expected levels of performance for accomplishing specific tasks. Additional research is needed to determine how these standards should be set.

Many respondents pointed out that the question of what constitutes managerial competence is still unresolved. This leaves an on-going need to establish what KSA's are necessary for different types of managers and supervisors, including SES-level personnel. The term "manager" is seen currently referring to an "ambiguous and indeterminate" set of KSA's. For example, one informant pointed out that a large segment of many SES jobs involves working with political appointees, and there is no set of KSA's defined for that sort of responsibility. Research in this area could include identifying the criteria now used to determine what constitutes competency in various managerial positions. It was also suggested that research seek to identify who the Navy now encourages to "climb up the managerial ladder" and ascertain the criteria used for such decisions.

In addition to analyzing the current requirements of KSA's, interest was expressed in looking at the possible implications of new technology, such as robots and computerized information processing systems. There was concern that these might change KSA's needed by both blue- and white-collar workers in the next five to ten years. One issue is the extent that individuals might be able or willing to be retrained or to re-focus themselves in mid-career in response to technological changes. Another issue is whether mid-career re-training can be similar to front-end training or whether there are unique problems involved in the former. One suggestion in this area was to conduct a case study of a Naval activity (e.g., Mare Island) that has gone through a rapid transition necessitating large scale re-training of the personnel.

## Existing Knowledge

Ghropade and Atchinson 1980 reviewed the concept of job analysis. Pearman 1983 weighed the advantages and disadvantages of implementing a systems approach to personnel management that combined with job analysis could aid decision-making. OPM 1983b reported that task-based job analyses were developed for the Army's centralized promotion program. David 1978 reported that job analyses were employed in the development of an integrated occupational statification system for both military and civilians within

the DoD. The Office of the Secretary of the Navy is currently sponsoring research on job/task analysis by D. Goodgame of Texas A&M University and on occupational task analysis and task levels by H. Parsons of Biotechnology.

The conference on Productivity and Work Motivation identified the lack of training and development for career civilian managers and supervisors as an impediment to better productivity (Broedling and Penn 1978 and Nebeker et al. 1978). Broedling et al. 1977 took an inventory of management techniques based on a sample survey of Navy military and civilian managers. In a survey of high-level private sector managers and the equivalent-level Navy civilian executives (GS 16-18), Lau et al. 1982 identified job characteristics and perceptions of the skills required for effective job performance. Lau et al. 1979 identified training needs as well as skills and activities of a group of Navy civilian executives. GAO 1979d criticized the established civilian career programs within the DoD as hindering the development of expertise in manpower and personnel management.

Technological change is expected to alter the knowledge, skills, and abilities needed on the job. Bikson et al. 1981 reported on the implementation of information technology in an office setting. Clegg 1979 deals with the process of job re-design. Research in this area, however, will have to focus on the demands of the particular technologies and tasks to which they are applied. A related issue is the acceptance of the application of new technologies to old tasks. Mecherikoff and Mackie 1970 examined attitudes effecting innovations in the Navy. Monitoring of the impact of new technology on the DoD workforce was one objective of the development of an integrated occupational stratification system for DoD (David 1978). The National Research Council's 1982 study of naval shipbuilding found that the new technology in shipbuilding would require a strengthening of the engineering and management functions and personnel.

There was not any extensive readily available literature on the criteria used to select managers. Filling such positions, of course, must conform to the Uniform Guidelines on Employee Selection Procedures. Quaintance 1980 examined the impact of the selection guidelines on public merit

selection. Holly and Schanie 1980 wrote an interpretive review of the selection guidelines.

This literature search identified a long-standing concern in OPM and its predecessor, the Civil Service Commission, about developing systematic procedures for identifying managerial talent and making promotions. Hall 1976 reported on the evaluations for upward mobility within the Bureau of Engraving and Printing. OPM 1983b reported on a computer-assisted evaluation and referral system developed for the Army's centralized promotion program. OPM 1979b identified major areas of concern for upward mobility program planning, including workforce patterns and needs, target positions, selection of program participants, training, counseling, and evaluations. The U.S. Civil Service Commission 1974a reported on a systematic plan for identifying managerial potential. The particular requirements of the plan would differ from agency to agency, but the report stressed the need for multiple measures when screening large numbers of candidates.

## C. Organizational Issues

The third clustering of research suggestions on productivity issues embraces a spectrum of organizational factors that interviewees perceived as possible impediments to productivity. These factors include:

- The classification system;
- Unfair labor practice grievances;
- Unfilled vacancies;
- Ceiling point restrictions;
- Leadership styles; and
- Work group specialization.

### Background

A central question raised in this cluster was the relationship between personnel functions and procedures and the productivity of operations.

While recognizing that many personnel procedures are legally necesssary, participants sought to identify the costs of that compliance with procedures as currently structured in terms of time, money, and organizational output. This information would provide a basis for identifying where streamlining or revision of functions and procedures would be desirable.

Several specific problem areas were identified. As a first step, interviewees suggested that measurement be made of the time and costs associated with the current classification system, which is perceived as being overly rigid and "meaningless." The system was criticized as penalizing employees who may perform essential tasks outside the scope of their job descriptions. These extra tasks are not appraised and so the full contribution of these employees is not credited. It was suggested that a comparison be made between the effectiveness of the present classification system and a matrix organization.

The handling of unfair labor practice grievances was perceived as both extremely costly and time-consuming. There is no Navy-wide data available to determine the amount of time spent handling such cases. A study was suggested which would determine alternative methods of dispute resolution to identify more timely and less costly methods.

A number of study participants, both those in the "personnel" world and those who work with it, were concerned with the productivity lost because of the amount of time required to fill vacant positions. There was general agreement that the present personnel selection procedures are cumbersome and many of them are designed to avoid possible grievances rather than to locate and select the best candidates. A study might be undertaken to analyze the primary causes of time delays and suggest how the process could be streamlined.

Although NIF's (Naval Industrial Facilities) no longer have ceiling point restrictions, a number of other Navy activities still do. According to participants, these restrictions force managers to expend time and energy upon "position management," diverting them from tasks more directly

related to production. Participants suggested that a study identify how managers of various activities respond to ceiling point restrictions and then measure the associated productivity costs attributable to this diversion.

A topic of much interest in many of the interviews was the different character of military and civilian personnel as well as the working relationship between the two groups. The predominant research theme which emerged from these concerns is the need to identify and then compare those leadership styles in terms of their impact upon the productivity of the workplace in different types of Naval activities.

The last organizational issue relating to productivity is the nature of the work group specialization in shipyard activities. It was suggested that downtime in ship maintenance activities is based on the highly specialized nature of the various work crews. This suggests the desirability of developing cross-training of workers in various skills so that time is not wasted in shifting between crews applying different specialties to the same work.

## Existing Knowledge

This literature search was unable to document quantitatively the time and costs involved in the current classification system, the processing of unfair labor practice complaints and other grievances, or the filling of vacancies.

OPM 1980d reported that senior government officials at an OPM-sponsored conference on productivity identified the classification system as imposing an arduous paperwork and regulatory burden. Carpenter and Chistal 1972 used data from a job analysis inventory to make assessments about the stability and objectivity of the civil service classification system. David 1978 reported on the development of an integrated occupational stratification system that classified both military and civilian personnel into a common occupational structure within DoD. Babcock and

Meriwether 1981 reported on a Navy experiment with pay and classification to determine whether a more flexible personnel system could help managers increase organizational effectiveness. This literature search also found conflict over the classification system between the application of classification standards and manager's needs for the upgrading of classifications to increase compensation because of pay ceilings that are perceived as under-compensating needed employees. Broedling et al. 1980 discussed this issue in their examination of impediments to productivity at a Navy industrial facility. Hayes et al. 1978 reported on a preliminary study of the causes of the general increase in grades of Federal civilian workers. GAO 1981b reported on causes and responses to DoD grade escalation.

Research into the time and costs of labor grievances will have to take into account the equal employment opportunity complaint process. Although it is not documented, some knowledgeable sources have suggested that a substantial portion of complaints filed under EEO provisions came because of inefficiencies in procedures for handling regular labor grievances.

Koslowski 1981 reported concern among the Navy's managers and personnel specialists about excessive time taken to fill positions whether through merit promotion or external hiring through OPM employment registers. He also reported concern over the impact of the Uniform Guidelines on Employee Selection Procedures.

GAO 1981a dealt with DoD's management of civilian personnel ceilings. NPRDC 1981 conducted a seven-month quantitative examination of the effects of the high grade limitation on Navy laboratories.

There is extensive literature on the relationship of civilian and military personnel. The conference on Productivity and Work Motivation identified a need for improved relationships between military and civilian managers (Broedling and Penn 1978; Nebeker 1978). Broedling et al. 1981 presented findings about the relationship between senior Navy civilian and military executives. Ekas 1980 reported on the relationship between military and civilians focusing on the Naval Material Command. Fordyce 1953

dealt with officer-civilian relationships within a Naval Engineering organization. Manley et al. 1980a focused on military-civil service distrust in an examination of attitudinal differences among military and civilians in their work for the Air Force. Korbol 1978 identified sources of animosity between Air Force military and civilian employees. Garza and Carpenter 1974 found distinct differences between airmen and civil service personnel having similar jobs in the Air Force. Cowan 1977 reported comparisons of Air Force military and civilian personnel with similar jobs in civil engineering specialties. Landolt 1978 compared Air Force military and civilian personnel specialists. Baker 1977 studied behavioral factors affecting the integrated military-civil service workforce. The Long 1977 study of the "sandcrab syndrome" found that the attitudes of Naval officers toward their counterparts among the civilian managers and technical personnel generally were not as negative as hypothesized. Wermuth 1979 explored the relationships and associated tensions between military and civilian members of the "armored convertible" defense establishment and identified the greater use of civilians as one feasible response to the requirements for greater support services per combat soldier. Johnson 1977 reported on resistance to the use of civilians as DoD program managers and cited advantages of using civilians in these positions. Klein 1980 outlined the Navy's very limited use of civilian executives to manage major weapon programs.

While not directed specifically to the level and costs of ship maintenance attributable to work group specialization, Williams and Mohr 1981 described the work processes in selected NARF shops and identified impediments to productivity. Broedling et al. 1980 found work-flow problems among the impediments to productivity at a Naval industrial facility. The National Research Council 1982 study of U.S. naval shipbuilding suggested that innovations in participatory management and the use of small multi-skilled worker groups had significant potential for improving productivity in the commercial construction of Navy ships and recommended that the Navy encourage experiments with worker participation and organizational innovations.

## PHASE III: IDENTIFY POTENTIAL STRATEGIES TO INCREASE PRODUCTIVITY

### Background

Following the format established for the various research issues identified in Phase II, strategies to increase productivity can be grouped under the headings of motivation, KSA's, and organizational factors.

Strategies suggested under this heading include:

- Identification of both monetary and non-monetary incentives used by the private sector and assessment of their transferability to the Navy civilian workforce;
- Identification of various motivational techniques now used in Navy activities and assessment of their success;
- Identification of educational tools to inform the workforce of the character of the dangers in working with hazardous materials;
- Identification of effective procedures for dealing with low-performance individuals; and
- Identification and assessment of other "promising practices" from the private sector for motivation through compensation, career ladders, and job conditions.

### Existing Knowledge

The Conference on Productivity and Work Motivation cited in the review of Existing Knowledge on Productivity Phase II-A (Broedling and Penn 1978) also issued proposals for solving common productivity problems identified at the conference (Nebeker et al. 1978).

Following up on the Senior Executive Associations warnings to Congress about the detrimental effects of the pay cap, Andronicos 1981 outlined problems in the DoD with attrition of civilian executives and called for the lifting of the pay ceiling.

Shumate et al. 1981 reported on a performance contingent monetary reward system for increasing individual productivity. Gilliam et al. 1980 for the General Research Corporation presented a proposed set of objectives

supporting strategies for managing the blue-collar workforce within the Federal wage system. General Research Corporation, under contract to the Office of the Secretary of Defense, is currently preparing a guide for the design and implementation of a productivity gain sharing program. This study follows up on several different DoD experimental incentive plans to motivate worker productivity with monetary rewards.

In attempting to increase employee morale and motivation by the intangible benefit of more flexible work schedules, voluntary experiments with alternative work schedules were implemented covering 250,000 Federal employees over three years in the late 1970's. GAO 1980a warned that the planned evaluation of the experiments by OPM might not provide the "valid and reliable data" necessary for adequate assessment because of inadequate staffing and budget limitations.

"Quality Circles," a concept borrowed from Japanese industry, provide for "in-house" consultation of employees in developing procedures to enhance productivity. Law 1980 looked at the growth of Quality Circles in American organizations, specifically focusing on the Norfolk Naval Shipyard program. Atwater 1981 surveyed the interest and involvement of Navy organizations in productivity improvement programs in general, and Quality Circles in particular.

Albanese et al. 1977 described a promotions policy model for Navy labs to cope with personnel ceiling restrictions, high grade controls, promotion restrictions, and other such limitations. Broedling et al. 1980 reported that responses to personnel ceilings included the contracting-out of work and the hiring of part-time employees under the Federal Part-time Career Employment Act of 1978 (Public Law 95-437).

Strategies for assisting in career development have become a major concern within the Federal personnel system relating to motivation. This concern is specifically addressed under organizational strategies of Productivity Phase III-C.

Improving productivity through the evaluation of individual job performance suggests a role for job analysis in public personnel management as a logical prior step (Ghropade and Atchinson 1980). Literature on task analysis is cited in Productivity Phase II-B. There is extensive literature on performance appraisal as a means of monitoring employee work, keeping the employee informed of his performance in the light of organizational expectations, and ironing out difficulties. Ratliff and Toedt 1978 reported on problems that undercut the Air Force's civilian appraisal program and outlined a research plan to develop a new evaluation system. Other sources include Hyde and Cascio 1982, DeMarco and Nigro 1983, Edwards 1983, Ralph 1980, Holley 1978, and Thayer 1981.

A running record on programs to deal with alcohol and drug abuse is kept by OPM, but these programs are generally instituted at the agency and lower unit level. This literature search did not identify other information strategies to deal with these problems within the Federal civilian workforce.

This literature search did not identify specific strategies for coping with problems of work morale for those working with hazardous wastes or debilitating work conditions.

This literature search did not identify procedures specifically designed for dealing with low performers, but performance appraisal, cited above, institutionalizes a method for identifying low-performers and providing them with feedback on the relation of their performance to expectations for their job assignments.

## B. Develop Strategies to Increase Knowledge, Skills and Abilities

### Background

Under this heading, study participants suggested research concentrating on developing both criteria and procedures for:

- Identifying potential managers;
- Determining the most appropriate materials for training managers; and
- Identifying both training and re-training needs to keep up with technological changes.

In addition, comments were made on the need to determine the return-on-investment of mid-career re-training and the optimum techniques to accomplish this. The coming introduction of NCPDS (Navy Civilian Personnel Data System) led some individuals to suggest studying the feasibility of using computer-assisted training both for this new system and for instruction in other personnel procedures.

## Existing Knowledge

There is concern over criteria used to select managers. Lau et al. 1980 reported on the content of managerial work in the public sector pertinent to developing more effective selection, as well as development and appraisal program. Katzell and Barrett 1966 presented a methodology for surveying Army practices for selecting first-line civilian supervisors and recommended improvements in the selection process.

Glasgow et al. 1981 studied different approaches for the training of Air Force civilian employees in the use of the job performance appraisal system.

Mid-career training strategies have received considerable attention. Lancaster and Berne 1981 reported on employer-sponsored career development programs. Gilbert and Sauter 1979 reported on the Federal Executive Institute's executive development programs. OPM 1979a presented an overview of the Federal Executive Development Programs's assessment center. Pyle 1979 evaluated personnel policies enhancing or inhibiting mid-career changes and motivation of mid-level Army civilians. Creighton et al. 1973 reported on the design of a personnel development and evaluation systems as a Navy demonstration project. No measures of return on investment in training were available.

This literature search was unable to document the feasibility and payoffs to be expected from computer-assisted training. Booher 1978 reported on job performance aids, which included the emerging application of computer technology. Nickols 1979 dealt with the "bottom line payoff" from training. Collins and Erlichman 1976a described the progress in the Navy's evaluation and training technology from 1966 through 1975.

## C. Ascertain Potential Organizational Strategies to Increase Productivity

Background

Under this heading, study participants recommended research to identify alternative techniques for defining jobs, handling unfair labor practice grievances, and reducing the number of unfilled vacancies. Alternative methods of reducing the number of unfilled vacancies has obvious implications for both the recruitment and retention research agendas.

Another research study could compare both the productivity and costs of those Naval activities operating without ceiling points to those which do operate under such constraints.

Researchers could devote some time to identifying strategies that might reduce the dissonance between the military and civilian leadership styles. For example, special briefing programs might be developed for both military leaders who are assuming responsibilities for shore establishments for the first time and civilians who are new to the Navy establishment. The military leaders could be sensitized to the situation of the civilian workers, and the civilians could be briefed on the particular culture of the Navy.

It was hypothesized that ship maintenance downtime is related to the organization of the work crews. Work team options could be explored to test this contention. The suggestion of "cross-training" of workers in multiple specialties could be assessed by experimentation with certain combinations of specialties.

There was also an expressed need to identify anticipated demands for NCPDS data and to develop an overall strategy to ensure that the new system is fully utilized for a wide range of personnel functions.

Existing Knowledge

The identification of techniques for defining jobs and handling unfair labor practice complaints is open to further research.

This literature did not identify particular strategies for reducing vacancies. Broedling et al. 1980 in their study of production impediments found that long-term vacancies usually involved positions for which there were few qualified available applicants.

This literature search yielded no information to determine optimum content for managerial training and use of information technology.

Strategies for reducing military-civilian conflict must confront the contention asserted in Wermuth 1979 that the built-in procedures of the military establishment discriminate against many civilians and tend to relegate civilians to a second-class status. Paulsen 1965 investigated management problems and personnel conflicts in the joint military-civil service organization as a dissertation at the Naval Postgraduate School. The thesis presented information for developing techniques to deal with these problems and conflicts. Stupak 1981 addressed issues concerning tensions between military officers and civilian careerists in DoD and presented behavioral techniques to ease these tensions. The Colvard 1982 study of the utilization of civilian executives in the Naval Material Command found that formal authority was largely concentrated in the hands of military officers and recommended a more balanced distribution of authority.

This literature search found no assessments of cross-training of workers in multiple specialties.

Further research is needed to identify NCPDS data and to develop plans for using the system.

## PHASE IV: TEST AND EVALUATE SPECIFIC STRATEGIES TO INCREASE PRODUCTIVITY

### Background

A number of evaluation activities were mentioned by study participants, some of them follow-up on strategies discussed under Productivity Phase III.

### A. Test and Evaluate Strategies to Increase Motivation

Participants pointed out a need to evaluate the impact of a number of programs that are already in place. These include:

- The SECNAV Fellowship and other "special recognition" programs: Do they increase motivation and productivity?
- The Merit Pay System: Does it increase or decrease accountability and performance?
- The China Lake Demonstration Project: Does it result in heightened morale, motivation, and productivity?
- Flex-time: Does it result in increased morale, motivation, and productivity?
- Current employee drug and alcohol referral programs: Do they have a significant impact on the workforce? What are the possibilities for cost-savings by combining them with the substance abuse programs of the active-duty military?

At this phase of productivity research, any other strategies identified in Phase III-A should be evaluated.

### Existing Knowledge

Mroczko and Northcutt in an OPM report reviewed experiments in improving productivity at Kelly Air Force Base through job enrichment, incentive awards, and group competition.

There are assessments of the use of monetary rewards for superior performance. Bretton et al. 1978, Shumate et al. 1978, and Dockstader et al. 1978 reported that economic incentives to reward individual performance did improve task performances in a year trial experiment with Navy civilian key entry operators. Implementation of regular merit pay provisions will require further research to evaluate its effectiveness in stimulating productivity. NPRDC is currently studying blue-collar workers at a Naval Airwork Facility to develop a performance management system.integrating work measurements, performance feedback and goal-setting, performance appraisal, and monetary incentives.

OPM 1981e reported on the successful experiments in improving productivity through management supported Quality Circles at the Norfolk Naval Shipyard that led to expansion of the program. A NPRDC research project is currently analyzing the effectiveness indicators based on a collection of baseline data at six sites prior to the implementation of Quality Circles at four of the sites with a follow-up survey of the six sites a year later.

Flex-time is one of the strategies for improving productivity subjected to considerable experimental test and evaluation. An early experiment with alternative work schedules was conducted at the headquarters of the U.S. Geological Survey (1977). Kissler et al. 1980 reported that at a large government research organization flex-time had no effect on productivity on the job but produced considerable net savings by reducing the use of sick time. Ronen and Primps 1980 in a survey of 25 public agencies showed that flex-time generally improved productivity by improving attitudes and lowering absenteeism. OPM 1982a conducted an evaluation of the Federal government's experiments with alternative work schedules. Overall the success of flex-time varied by type. Management discontent with some of the experiments caused 16 of 93 agencies to seek to abandon the alternative schedules. Army and Air Force units were among those seeking to quit, alleging difficulties of accommodating military operations to flexible work schedules. Senior military personnel in an Air Force experiment disliked the flexibility given the civilians.

Critics of flex-time raise the issue of the long-term effects of the introduction of alternative work schedules. Rainey and Wolf 1981 and 1982 have suggested that flex-time may adversely effect organizations in ways that do not show up in measures of immediate effects.

Dockstader 1977 tested the hypothesis that individuals will spontaneously set performance goals for themselves when their feedback is related to a standard of performance. Pritchard et al. 1981 reported the results of a field test of the effects of feedback and goal-setting techniques on productivity in two groups of Air Force clerical employees and discussed potential applications to other situations.

Johnson 1974 evaluated the performance appraisal system for Air Force civilian employees and identified strengths and weaknesses. This led to further research reported by Toedt and Ratliff 1978 on a more appropriate design of such a system.

This literature search found no documentation of the impact of the SECNAV or other programs for special recognition of individuals. OPM 1980a described the Workforce Effectiveness and Development Group's program to document exemplary practices in Federal productivity and specifically cited the Productivity-Enhancing Incentive Funds Program for securing quick investment returns from low cost "grants." Chang et al. 1983 surveyed 1600 civilian managers in the Navy and distinguished the performance of the most "exemplary" managers.

This literature search produced no published documentation of the impact of the China Lake project.

A major research concern will be to evaluate programs for dealing with alcohol and drug abuse. Preliminary work by Manley et al. 1979 and 1980b in identifying alcohol problems among DoD employees were cited in Phase II-A.

## B. Test and Evaluate Screening and Training Strategies

### Background

This segment of research activities would examine the effectiveness of procedures and training techniques developed under Phase III-B on KSA strategies. Among the objectives of these strategies are:

- Early identification of prospective managers;
- Initial training of managers;
- Re-training required by technological changes;
- Other mid-career training; and
- Computer-assisted training.

### Existing Knowledge

This literature search was unable to document any information of the testing or evaluation of screening and training programs.

## C. Test and Evaluate Organizational Strategies

### Background

The China Lake Demonstration Project was of interest to a number of participants. It was suggested that China Lake's classification and appraisal system might be compared to private sector systems in terms of administrative times and costs. There was interest in replicating the China Lake Model at other Navy activities, but curiosity was expressed about whether such a personnel system would work in other Navy environments, particularly those with a larger ratio of WG to GS personnel. There was particular concern for the possible labor relation implications with the unions.

Other suggestions included testing and replicating any promising alternative techniques for handling unfair labor practice disputes and evaluating new models developed to reduce the downtime in ship maintenance.

Existing Knowledge

This literature search found no documentation of tests of potential organizational strategies proposed for Productivity Phase IV-C.

## OUTCOMES

As a result of the research activities suggested above, OP-14 could provide policy guidance based on impact data on productivity. It could offer both guidance and technical assistance on training strategies, reforms of the classification system, changes in the appraisal systems, and procedures for reducing the time and costs involved in personnel functions.

## SUMMARY OF PRODUCTIVITY RESEARCH

**PHASE I: ESTABLISH BASELINE MEASURES**

Develop Valid Measures for Productivity

**PHASE II: ANALYZE ISSUES AFFECTING PRODUCTIVITY**

A. Analyze Motivational Issues

1. Determine the Relationship Between Motivation/Morale and Productivity

2. Identify the Most Important Motivating and Inhibiting Factors for Various Categories of Personnel

3. Determine the Impact on Productivity of Specific Motivational Problems.
   a. Difficulties in Working with Hazardous Materials
   b. Drug and Alcohol Problems
   c. Poor Office Environments
   d. Presence of Consistently Low Performers

B. Analyze Needs for Specific Knowledge, Skills, and Abilities (KSA's)

1. Develop a Methodology for Task Analysis for White Collar Jobs

2. Identify the KSA's Needed for Supervisors and Managers at Various Levels and in Different Specialities Including SES, as Well as for Other Selected White Collar Jobs

3. Identify the Criteria Currently Utilized to Select Managers

4. Identify the Prospective Impacts of Changing Technology on KSA Needs

C. Analyze Organizational Issues

1. Measure the Time and Costs Associated With the Following Procedures:

   a. The Current Classification System
   b. Handling of Unfair Labor Practices Grievances (ULP's)
   c. The Filling of Vacancies

2. Determine How Managers Respond to Ceiling Point Restrictions and Identify Associated Productivity Costs

3. Identify Differing Interaction Styles and Structures Between Military and Civilian Leadership in Differing Activities and Determine Which Result in Greatest Productivity

4. Assess the Level and Costs of Downtime in Ship Maintenance Caused by the Specialization of Work Groups

## PHASE III: IDENTIFY POTENTIAL STRATEGIES TO INCREASE PRODUCTIVITY

A. Develop Strategies to Increase Personnel Motivation

1. Identify Monetary and Non-Monetary Incentives Offered by Private Industry to Increase Productivity and Assess Transferrability

2. Examine Motivational Techniques Currently Used by Navy Activities and Identify the Most Successful

3. Develop Educational Strategies to Inform Workforce of Dangers in Working With Hazardous Materials

4. Identify More Effective Procedures for Handling Low Performers

5. Identify and Assess the Feasibility of Other Potential Changes to Compensation Packages, Career Ladders, Job Conditions etc. that Appear Most Likely to Enhance Motivation

B. Develop Potential Strategies to Increase KSA's

1. Develop Effective Criteria and Procedures to Identify Prospective Managers

2. Determine Optimal Content for Managerial Training, Identifying Strategies to Use Information Technology in Management

3. Identify Training and Re-training Needs and Strategies to Keep Pace with Technological Changes

4. Determine the Return-on-Investment and Identify Optimal Techniques for Mid-Career Training

5. Assess the Feasibility and Pay-offs of Computer-Assisted Training in Selected Areas, Especially for NCPDS Training and Basic Personnel Procedures

C. Ascertain Potential Organizational Strategies to Increase Productivity

1. Identify Successful Techniques for Handling ULP Grievances

2. Identify Effective Procedures to Reduce Unfilled Vacancies and Enhance the Productive Role of the Personnel Office

3. Compare the Productivity and Costs Incurred of Activities Operating Without Ceiling Points to Those Operating With Them

4. Identify Organizational and Training Options for Reducing Military-Civilian Dissonance

5. Assess Potential Cross-Training and Work Team Options to Reduce Ship Maintenance Downtime

6. Identify Anticipated Needs for NCPDS Data and Develop Plan to Insure the Most Effective Utilization of the System for Personnel Functions

**PHASE IV: TEST/EVALUATE SPECIFIC STRATEGIES TO INCREASE PRODUCTIVITY**

A. Test and Evaluate Strategies to Increase Motivation

1. Evaluate the Impact of the SECNAV Fellowship and Related Special Recognition Programs on Motivation and Productivity

2. Evaluate the Impact of the Merit Pay System on Increasing Accountability and Performance

3. Evaluate the Impact of the China Lake Demo Project on the Morale and Motivation of Personnel

4. Evaluate the Impact of Flex Time on Productivity

5. Evaluate the Impact of Current Employee Drug and Alcohol Programs and Assess Opportunities for Cost-Savings through Combination With Military Programs

6. Test Other Promising Motivational Techniques and Compensations

B. Test/Evaluate Screening and Training Strategies

1. Determine the Impact of Training on the Productivity and Performance of Personnel

2. Test Computer-Assisted Training and Evaluate its Relative Costs and Effectiveness

C. Test/Evaluate Organizational Strategies

1. Compare the China Lake Demonstration to Alternative Private Sector Classification and Appraisal System in Terms of the Time and Cost Required for Administration

2. Replicate the China Lake Demonstration at Other Activities and Evaluate its Impact on Administrative Costs

3. Test New or Replicate Successful ULP Handling Techniques

4. Test and Evaluate Alternative Models for Reducing Ship Maintenance Downtime

## OUTCOMES

A. Policy Guidance From OP-14 Based on Impact Data on Productivity

B. Policy Guidance and Training and Technical Assistance for Successful Training Strategies and Training priorities

C. Policy Recommendations to Higher Levels on Alternative - Organizational Strategies, Including Changes In Classification System, and Procedures For Reducing Time/Cost Of Personnel Functions

## EQUAL EMPLOYMENT OPPORTUNITY

### OVERVIEW

In surveying the various objectives of the civilian personnel program, there was much discussion about whether or not Equal Employment Opportunity (EEO) objectives should be considered separately from other personnel objectives. Although it was decided to treat EEO as a separate research array, it should be noted that many of the research suggestions also appear under the headings of Retention or Recruitment. For example, one suggestion under Retention was the need for research into career advancement patterns. Dissemination of that information could answer employees questions such as "What do I need to do to get where I want to go?" or "What kinds of work experiences would make me more competitive?" Research useful to answering these questions can apply to the workforce as a whole as well as to minorities in particular. Therefore, a number of the research suggestions discussed below as being most pertinent to EEO objectives also overlap considerably with other research arrays. The convergence chart for EEO is presented in Figure IV-5.

### PHASE I: ESTABLISH BASELINE MEASURES

There are two main areas in which to develop baselines for research on equal job opportunities:

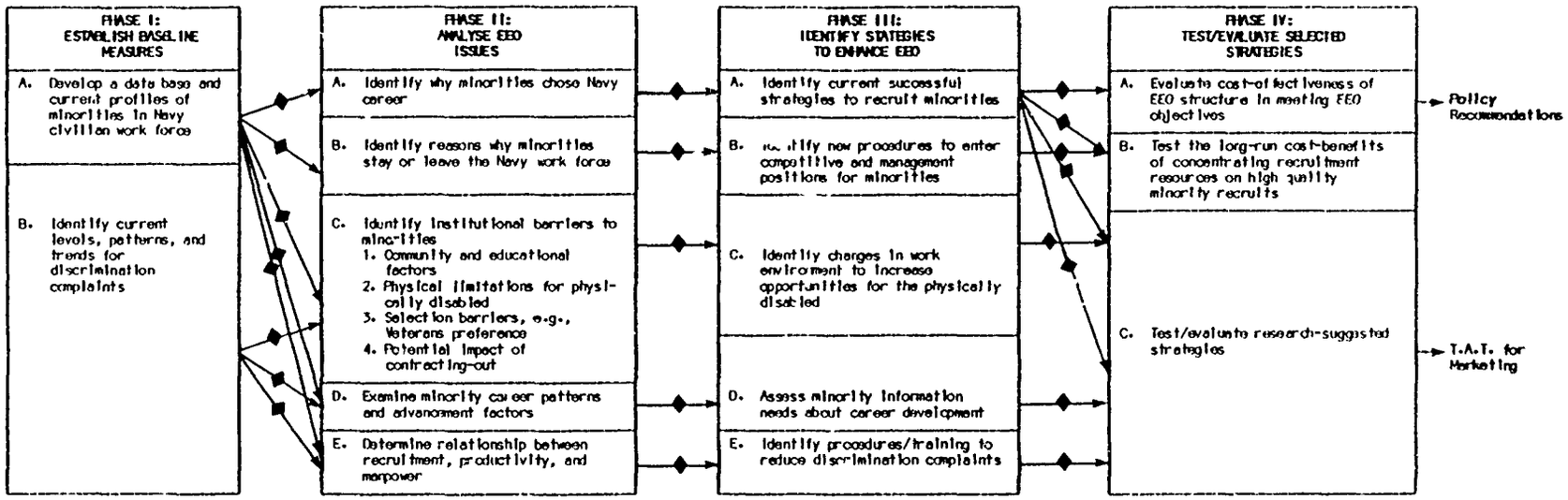
A. Develop a data base and current profiles for minorities in the Navy civilian workforce; and

B. Identify current levels, patterns and trends for discrimination complaints.

#### Background

Although it was acknowledged that the Navy EEO program has collected a great deal of statistical information, study participants suggested a need to develop a demographic model for all minorities now in the Navy civilian

FIGURE IV-5
CONVERGENCE CHART:
ARRAY OF EQUAL EMPLOYMENT OPPORTUNITY RESEARCH




◆ Is there sufficient knowledge about the subject?

- If yes, proceed to next phase
- If no, additional research is required

workforce. This would provide a base for developing representative profiles of the various minority populations. This base could be used for "impact research" prior to any major policy decision. For example, when the Navy considers a $400,000 budget to recruit Hispanics through a mass media campaign, such a campaign could be preceded by a pilot study tested on a sample of the Hispanic civilian workforce. Based on their responses to the initial recruitment appeal, the strategy could be readjusted before the campaign was fully implemented.

A second suggestion for baseline research was to identify the patterns of discrimination complaints: the basis of complaints, the issues involved, the settlement and resolution rate, and the processing time involved. This data should be collected for the Navy civilian workforce as a whole and then re-examined in various "slices" as well as Navy-wide, so it could be determined whether particular locations or activities generated disproportional complaints or particular types of complaints. It could be determined if particular groups differed in the nature and extent of their complaints. Trends over time could be identified. Various other comparisons could be readily made once the data were fully coded for machine retrieval.

## Existing Knowledge

Since 1976, OPM has published annually Equal Employment Opportunity Statistics: Federal Civilian Workforce Statistics, which provides the numbers and percentages of MGD (Minority Group Designation) full-time employees by agencies broken down by geographical areas, pay, and grade; changes in MGD percentages are included. OPM 1981d reported indices of underrepresentation of MGD groups in the various federal agencies. Defense Manpower Commission 1976 v. 4 included examination of minority and female participation in the Department of Defense. McGonigal 1981 compared the composition and compensation patterns of minority and female scientists and engineers in DoD relative to their white male counterparts.

Gastwirth and Haber 1976 dealt with the definition of the labor market useful for equal employment standards. Haber 1978 dealt with the racial composition of workers available for hiring. Although aimed at estimating

potential contributions to the supply of military personnel, Borack 1980 essayed a forecast of the supply of women available to the Navy. Atwater et al. 1983b estimated minority group availability for the Navy's civilian workforce by applying econometric models to the 1980 census special EEO file covering various localities in the population surveys.

The Navy's Civilian Personnel Command maintains a file of discrimination complaints, which it intends to put into a machine-readable database. However, this information is not now organized so as to identify the nature, extent, and trends of discrimination complaints. Knowledgeable sources suggest the possibility that many employee grievances that would not otherwise constitute EEO complaints are routed through the EEO process because other grievance processes are less attractive to complainants. This could present problems in interpreting the data. Although the available data has not yet been systematically examined, it has been suggested that the greatest volume of complaints may relate to age discrimination. It has also been suggested that, proportional to the representation of the respective groups in the Navy's civilian workforce, complaints are filed most frequently alleging race discrimination, followed by sex discrimination, and then age discrimination. Discrimination against the physically disabled is another source of complaints, but the affected populations are not as precisely defined as with race, sex, and age groupings. There may also be a number of complaints of discrimination according to religion. Analysis of the magnitude and character of EEO complaints would appear to warrant further research.

## PHASE II: ANALYZE ISSUES AFFECTING EQUAL EMPLOYMENT OPPORTUNITY

### A. Identify the Primary Reasons Why Minorities Chose a Navy Civilian Career

Background

Although discovering what motivates an individual to choose to enter the civilian workforce was of general interest under the Recruitment

objective, particular interest was expressed in ascertaining why Hispanics and other minorities choose the Navy, what are the major "selling" points and what are the disincentives. It was suggested that research be directed toward identifying the networks through which minorities have learned about and become attracted to scientific and engineering careers.

Existing Knowledge

There are some references on why minorities choose a Navy military career. For example, Mayas and Smith-Watson 1980 studied black college males' perceptions of the Navy and Navy careers based on a survey of 1233 black and white undergraduate males. Based on a survey of 1000 recruits of each sex, Thomas 1977 dealt with the reasons that women enlist. Borack 1978 and Gray Advertising 1978 examined young women's intentions of joining the services. However, no sources were found on why minorities or women might particularly choose a Navy civilian career or how such employees learned of job opportunities. Johnson 1982 compiled an annotated bibliography of Navy job-related male-female differences.

## B. Identify the Primary Reasons Why Minorities Stay or Leave the Navy Civilian Workforce and Where They Go

Background

Also mentioned under Retention, it is a concern for EEO purposes that managers often fail to ascertain "honest" information on why minorities choose to leave their positions. This information may be difficult to elicit, particularly by managers or supervisors not trained in personnel skills for sensitive exit interviewing. Follow-up data is also needed on the subsequent positions that former employees take either within the Navy or outside.

In addition, study participants suggested a need to know why minorities do, in fact, maintain a career with the Navy and what are the primary

retention considerations for different ethnic groups, women, and the physically disabled.

Existing Knowledge

No studies were found focusing specifically on why minorities stay or leave the Navy civilian workforce. Some information may be gleaned by checking into references on attrition cited in the Existing Knowledge section of the Retention Phase II-A, particularly Curry 1974, French 1982, and McGonigal 1978a.

## C. Identify Institutional Barriers to Entry and Advancement for Minorities

Background

Potential research topics under this area include the examination of:

- Community and/or educational system factors at the high school level which might lead to negative attitudes toward major Navy civilian career fields such as scientist and engineer training;
- Physical limitations on participation by physically disabled in the workplace;
- Selection barriers such as Veterans' Preference regulations or the former PACE exam; and
- The impact of contracting-out particularly in areas which would otherwise be for entry-level positions (e.g., janitorial or housekeeping services).

Existing Knowledge

Eliminating barriers to equal employment opportunity is a general public policy commitment as discussed in Hudson and Broadnax 1982. Issues of affirmative action and human rights were the subject of a special issue of Public Personnel Management, Remick (ed.) 1981. Identification of all pertinent sources on these issues goes beyond the scope of this review of

the literature, which concentrated on personnel policy and practices within the Federal government, particularly the Navy. Further research is needed into issues of EEO and affirmative action recruitment, institutional barriers for the physically disabled and others, and minority career patterns, performance, and promotion. Literature from the Civil Rights Commission offers informational sources to begin the identification of pertinent existing knowledge.

## D. Examine Minority Career Patterns and Identify Factors Affecting Advancement

### Background

This research suggestion is similar to those made in the Retention array except that the focus would be on minorities and their advancement patterns. Successful career patterns might be used as a guide for others. Trends might emerge from such descriptive data. It might be found that advancement is often associated with movement into particular activities as with the Army's recruitment of women in its own clerical force for promotion within its procurement operations. "Dead end" positions might also be identified or it may be found that career advancement is facilitated by a formal or informal sponsor of the same sex or ethnic group.

### Existing Knowledge

No information was identified on minority career patterns and factors affecting advancement among minorities.

## E. Determine the Relationship Between the Recruitment of Minority Personnel, Productivity, and Manpower Needs

Background

This research would endeavor to assess the impact of the mandate to meet EEO objectives and the possibility that less qualified personnel are being recruited and retained so as to meet these objectives. If this proves to be the case, further research should examine the impact on the productivity of the workforce.

Another research strategy would be to analyze "high shortage" areas based on manpower forecasting and relate these areas to EEO recruitment endeavors to ascertain whether personnel needs can be correlated with the social objectives of EEO efforts.

Existing Knowledge

No information is readily available on how the recruitment of minorities might affect productivity and manpower levels.

## PHASE III. IDENTIFY POTENTIAL STRATEGIES TO ENHANCE EQUAL EMPLOYMENT OPPORTUNITY

### A. Identify Successful Techniques Currently Utilized to Recruit Minorities

Background.

Numerous research suggestions centered around this theme of identifying successful techniques. Specific Naval activities are known for very successful minority recruitment activties; for example, the Puget Sound Shipyard has an excellent record in attracting women into apprenticeship programs. While such "success stories" are known anecdotally, there is no detailed study analyzing different techniques for recruiting minorities or comparing success rates throughout the Navy. In addition to examining Naval activities, it would also be possible to examine other government agencies with exemplary recruitment records and to transfer such techniques to the Navy civilian setting.

Based on information from Phase II A and C, promising sources of minority (especially Hispanic) recruits should be identified along with specific strategies to overcome barriers to entry.

Existing Knowledge

Although information is available about the representation of MGD individuals in Federal agencies and their estimated availability in the workforce as cited in EEO Phase I, less information was found on special means for recruiting minority group individuals.

Bellone and Darling 1980 discussed some of the problems and strategies in implementing affirmative action programs. Burroughs and Niehaus 1976 reviewed the Navy's evaluation of its first prototype EEO models and control systems, noting that policy that sets EEO goals must consider such things as budget, labor market availability, and personnel progression rates. Charnes et al. 1979 described a set of Navy civilian manpower planning models designed to accomodate EEO requirements.

There has been some research to develop strategies to increase minority recruitment. Triandis and Hui 1983, for example, attempt to identify some of the particular barriers to recruitment and advancement of Hispanics and propose some ameliorative steps. Although documentation of the extent of minority recruitments efforts is not readily available, knowledgeable sources point to efforts to recruit at particular colleges and localities where minorities are concentrated. In general, more research is needed to identify procedures to enhance minority recruitment and advancement, expand opportunities for the physically disabled, to assess career information needs of minorities, and to identify procedures to reduce discriminination complaints.

## B. Identify New Tests and Procedures Necessary to Allow Minorities to Enter Competitive Positions and Advance to Management Positions

Background

The consent decree and subsequent discontinuation of the Professional Administrative Career Examination (PACE) in 1983 had, according to many

study participants, widespread implications throughout the recruitment and retention arenas of the personnel system and the workforce composition. Although the impact was certainly not limited to minority groups, it might affect them disproportionately. Many informants pointed out the need to develop new or identify existing procedures which could replace the role of the PACE exam so as to allow more minorities to enter the workforce in competitive positions. Procedures also should be developed to allow Schedule B minority appointees to demonstrate the job proficiency to enter higher grade career slots without open competition.

Existing Knowledge

No information was readily available on tests and advancement procedures particularly suitable to minorities.

## C. Identify Potential Changes That Would Expand Opportunities for the Physically Disabled

Background

The need to explore alternative work sites was a research suggestion for expanding the role of the physically disabled Federal worker. It was suggested that a study be done to identify the kinds of jobs that can be performed productively at home or elsewhere away from traditional worksites with the Navy providing the necessary equipment to accomplish designated tasks.

A similar research suggestion concerned those who had been injured and disabled while on the job. Normally, these employees receive compensation while others are hired to fill their positions; in a sense, the government is paying for two people, the injured party and the replacement. The research question concerned the feasibility of retraining the injured party, given that they can physically do other work, so that the government would no longer be paying twice for the same job position, and the injured worker could move to another position.

Existing Knowledge

Further effort is required to locate information useful for expanding the opportunities of the physically disabled.

## D. Assess Minority Information Needs About Career Development and Identify Appropriate Strategies

Background

This research would build directly upon the information gathered in Phase II-D to examine the present patterns of career development among minorities and to identify factors affecting advancement patterns. The next step would be to ascertain their information needs and how much of this information is already known to the various populations. Research would also attempt to identify new strategies as well as develop those identified by existing patterns.

Existing Knowledge

No information was readily available for assessment of the particular information needs of minorities in advancing their careers.

## E. Identify Procedures or Training Programs That Could Reduce Discrimination Complaints

Background

Based on information gathered in Phase I-B on patterns and trends in discrimination complaints, it would then be possible to explore training techniques or procedures which might reduce the volume of complaints, particularly from disproportionately represented sources.

Existing Knowledge

No information was readily available on how discrimination complaints might be reduced and thus further research appears warranted.

## PHASE IV: TEST AND EVALUATE SPECIFIC STRATEGIES TO ENHANCE EQUAL EMPLOYMENT OPPORTUNITIES

**A. Evaluate the Cost-Effectiveness of the EEO Structure in Meeting EEO Objectives; and**

**B. Test the Long-Run Cost-Benefits of Concentrating Recruitment Resources on High Quality Minority Recruits**

Background

The first research concern is based on some study participants' hypothesis that the present EEO program may not be the only way to meet the objectives of EEO. Research could test the hypothesis that adequate numbers of minorities would be recruited into and retained by the civilian workforce without a separate program but rather by integrating EEO responsibilities into the mainstream of personnel functions. The second research concern is to assess relative effectiveness of expending resources on intensive recruitment of highly qualified minorities as opposed to emphasizing recruitment of a larger number of individuals who may need extensive training. Tests of the two strategies would then be compared in terms of retention rates and supervisor appraisals.

Existing Knowledge

Because of the sparce information available on EEO strategies for the Navy's civilian personnel workforce, it is not surprising that this literature search found no reference to evaluations of the cost-effectiveness of

EEO structures within the Navy's civilian personnel administration, tests of the long-run cost-benefit of concentrating recruitment resources on "high-quality" minority candidates, or systematic assessments of other strategies. Research in this would likely be breaking new ground.

### C. Test and Evaluate Selected Strategies Suggested by Research

Background

The testing and evaluation of selected strategies for fulfilling EEO objectives should cover:

- Alternative recruitment techniques;
- Alternative tests/procedures for entry or advancement into competitive positions;
- Opportunities for non-job site work activities; and
- Training techniques to reduce discrimination complaints.

Existing Knowledge

Research on these items would contribute to the existing gaps in the literature.

## OUTCOMES

Research results could be used as the basis for policy recommendations for feasible changes in the EEO process and recruitment procedures. In addition, some of the research would be useful in terms of technical assistance concerning marketing mechanisms for minority recruitment.

## SUMMARY OF EQUAL EMPLOYMENT OPPORTUNITY RESEARCH

**PHASE I: ESTABLISH BASELINE MEASURES**

A. Develop a Data Base and Current Profiles for Minorities in the Navy Civilian Workforce

B. Identify Current Levels, Patterns, and Trends for Discrimination Complaints

**PHASE II: ANALYZE ISSUES AFFECTING EQUAL EMPLOYMENT OPPORTUNITY**

A. Identify Primary Reasons Why Minorities Chose Navy Civilian Careers

B. Identify the Primary Reasons Why Minorities Stay or Leave the Navy Civilian Workforce and Where They Go

C. Identify Institutional Barriers to Entry and Advancement for Minorities, Including:

1. Community and education system barriers to selection of Navy civilian career fields
2. Physical limitations for the physically disabled in the workplace
3. Selection barriers such as Veterans' preference
4. Potential impact of contracting-out

D. Examine Minority Career Patterns and Identify Factors Affecting Advancement

E. Determine the Relationship Between the Recruitments of Minority Personnel, Productivity, and Manpower Needs

**PHASE III: IDENTIFY POTENTIAL STRATEGIES TO ENHANCE EQUAL EMPLOYMENT OPPORTUNITY**

A. Identify Successful Techniques Currently Utilized to Recruit Minorities

B. Identify New Tests and Procedures Necessary to Allow Minorities to Enter Competitive Positions and Advance to Management Positions

C. Identify Potential Changes in the Work Environment That Would Expand Opportunities for the Physically Disabled

D. Assess Minority Information Needs About Career Development and Identify Appropriate Strategies

E. Identify Procedures or Training Programs That Could Reduce Discrimination Complaints

**PHASE IV: TEST/EVALUATE SELECTED STRATEGIES TO ENHANCE EQUAL EMPLOYMENT OPPORTUNITIES**

A. Evaluate the Cost-Effectiveness of the EEO Structure in Meeting EEO Objectives

B. Test the Long-Run Cost-Benefits of Concentrating Recruitment Resources on High Quality Minority Recruits

C. Test/Evaluate Selected Strategies Suggested by Research

**OUTCOMES**

A. Policy Recommendations to Higher Levels on Changes in the EEO Process and Recruitment Procedures

B. Technical Assistance and Training on Marketing Mechanisms

# V. RESEARCH PRIORITIZATION PLAN

## PRIORITIZATION OBJECTIVES

The Roadmap provides a comprehensive overview of the universe of potential civilian personnel research topics. Further, it arrays these research topics into logical linear sequences designed to support Navy mission objectives. It does not, however, define specific research projects to be conducted or indicate the interaction between research areas. Nor does it indicate the relative priority of alternative research areas. These tasks require the application of judgments by appropriate Navy decision-makers.

The conduct of a prioritization process is critical to transform the Roadmap from a reference document to a plan which guides the allocation of resources to specific studies and research and development efforts. All of the research areas described in the Roadmap may be desirable to pursue given unlimited resources. Since research resources in this area traditionally have been scarce, however, it is critical to identify those research areas that are likely to have the greatest yield in terms of results applicable to multiple objectives. A set of logical and soundly justified research priorities will simplify future planning and budgeting and should allow OP-14 and others in the civilian personnel community to maximize opportunities to capture funding and insure that the research that is conducted is consistent with agreed upon Navy needs.

Unfortunately, a number of factors make prioritization a difficult task:

- The number and diversity of choices available;
- The multiplicity of criteria that affect perceptions of priority; and
- The varying importance of different research areas to different Navy constituencies.

Ideally, prioritization would result in a ranked listing of research areas and projects that represent the consensus of the Navy civilian personnel community, using agreed-upon criteria tied to Navy needs. The following sections briefly describe a conceptual approach to prioritization as well as a specific process designed to respond to that goal.

## CONCEPTUAL APPROACH

Two key isses need to be resolved before a specific prioritization process can be determined:

- Who participates in the process; and
- What criteria are used to set priorities.

Broad participation in establishing priorities is potentially desirable for a number of reasons. First, as the interviews evidenced, different groups have legitimately different perspectives on what research is needed and useful to conduct. Secondly, obtaining wide consensus on a set of research priorities both increases the commitment of the participants and the perceived credibility and importance of the priority research areas.

On the other hand a smaller group is desirable for the sake of the efficiency of the decision-making process. In the final analysis, there is a small group of key decision-makers who must be committed to the plan and take responsibility for its implementation.

Consequently a dual stage process is recommended that allows for broad initial input, with refinement and final selections made by a smaller group. The initial group should include consumers of the research, researchers, and approvers and funders of research. The original group of interviewees (approximately 40) would be a logical and appropriate group for this purpose. The small group should be comprised of the central

decision-makers in the civilian personnel arena. The official membership of the current Project Guidance Team could serve this purpose.

While the literature is replete with numerous potential criteria for prioritization of research, there are basically three relevant categories of criteria that are useful in thinking about this project: Importance criteria, technical feasibility criteria, and financial feasibility criteria.

Measures of perceived importance or utility of research should be the primary criteria driving the prioritization process. Various practical issues, such as the likely availability of funds to support particular types of projects or the cost to complete a research effort, may ultimately determine the final selection of projects; but these are properly secondary judgments to be made within the context of a clear understanding of what research is most important to complete.

The concept of importance might be operationalized through three measures on which judgments could be made:

- The relative importance to the Navy of improving effectiveness in a particular area (e.g., selection and screening or the offering of attractive compensation package to enhance recruitment);
- The relative need for new information in order to be able to improve capabilities within an area; and
- The likelihood of being able to utilize research findings effectively to help reach an objective.

Participants could rate each research area against each of these three criteria on a Likert scale, the results would then be mathematically combined to produce an overall importance rating for each area.

Once research areas have been rated and placed into priority categories based on relative importance, a number of technical feasibility judgments must be made to break research areas down into specific projects and refine the assigned priority levels. Factors to be considered in this process include:

- The adequacy of existing knowledge in an area (to help determine where to begin within a sequenced array of potential research projects);
- The likelihood of research success;
- The time required to complete the research; and
- The estimated cost to complete the research.

These judgments may be made by research experts, with information provided to decision-makers. The broad involvement of researchers at this stage could enrich the process substantially.

Finally, financial feasibility judgments must be made to determine which projects will be pursued through which potential funding mechanisms. Critical factors to consider include:

- The likelihood of funding support by agencies outside of the Navy;
- The fit with the priorities and constraints of various funding sources; and
- The availability of in-house Navy expertise to conduct desired research.

## TASK PLAN

To implement the prioritization approach described above, the following tasks would need to be carried out:

1. Design Procedures and Instruments

   1.1 Develop primary sub-arrays for each array in the convergence charts (e.g., for recruitment, sub-arrays would address compensation factors as an attraction, non-compensation factors as an attraction, outreach and marketing, and selection and screening), and identify generic categories of research which cross-cut specific objectives.

   1.2 Prepare draft instrument for rating sub-arrays (research areas) on importance criteria.

   1.3 Develop analysis program.

   1.4 Prepare draft letter and supporting materials for participants.

   1.5 Prepare agenda outlines for PGT sessions.

2. Conduct Initial PGT Session

   2.1 Review proposed sub-arrays, criteria, and instrument.

   2.2 Review proposed participants and process for prioritization.

   2.3 Make revisions as necessary.

3. Conduct Survey of Participants

   3.1 Mail out survey.

   3.2 Tabulate and analyze data.

   3.3 Adjust sub-arrays as necessary and arrange into three priority categories or levels.

4. Conduct Feasibility Analyses (top two priority levels)

   4.1 Identify proposed research projects and sequences based on assessments of existing knowledge.

4.2 Estimate time and cost parameters.

4.3 Estimate likely research success.

5. Conduct Final PGT Session

5.1 Review importance ratings and adjust assignments to priority levels as appropriate.

5.2 Adjust rankings as appropriate based on technical and financial feasibility criteria and data.

5.3 Tentatively identify potential funding sources.

6. Document Results

6.1 Write-up priority listing and outcomes.

# VI. RESEARCH MANAGEMENT PLAN

## CHARACTERISTICS OF A RESEARCH MANAGEMENT SYSTEM

The development of the Roadmap and the execution of the proposed priority setting marks the beginning of a comprehensive research planning process. As depicted in Figure VI-1, a fully integrated research management system is comprised of seven major components:

- Goal Definition;
- Research Plan Development;
- Selection of Research Projects;
- Research Monitoring;
- Evaluation of Research Findings;
- Dissemination of Knowledge to Users; and
- Research Utilization.

The Goal Definition component provides an explicit statement of program goals and objectives. The Plan Development and Project Selection components provide a structure for translating program objectives into specific research needs and projects. These components have been addressed by the preceding sections of the Roadmap.

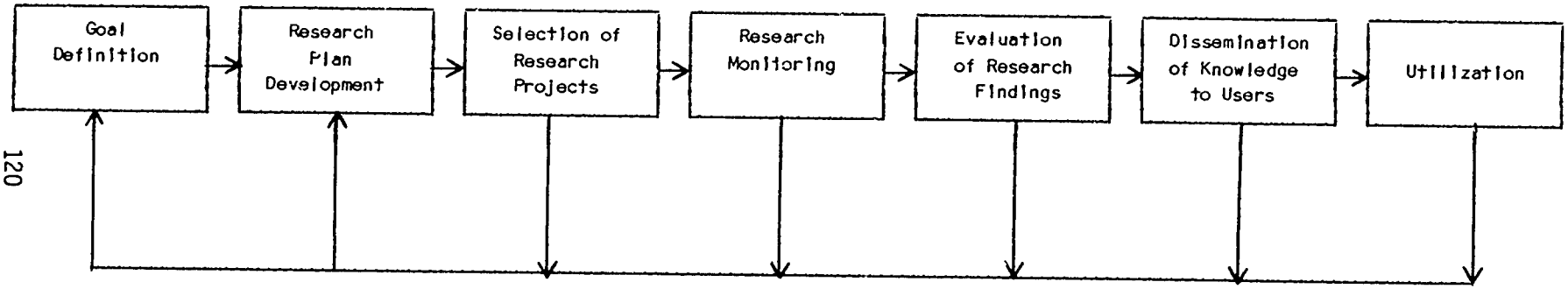
The primary function of the Monitoring and Evaluation components is to determine the actual contribution of individual research activities toward the accomplishment of the program objectives. These components involve:

- Coordination of relevant research projects sponsored by various organizations;
- Collation of findings; and
- Modification of the convergence charts and research plans based on evaluations of research results and implications.

The last components, Dissemination and Utilization, focus on what knowledge should be disseminated, to whom, and how. These components are critical to ensure that the research fulfills its intended role of

FIGURE VI-1

RESEARCH MANAGEMENT SYSTEM



accomplishing program objectives. Unfortunately they are often overlooked, thereby defeating the purpose of research and undermining support for the research program.

The key feature of the research management system is its dynamic nature. On-going feedback mechanisms are needed so that the research logic and the research priorities can be regularly revised as each project produces results. Both research findings or changes in Navy or Federal policies and priorities may indicate that some research activity areas in the Convergence Charts are not fruitful and should be dropped, that new ones should be entered, or that relative priorities and logical sequences should be changed. Ideally, a research management system should provide the continuous capability to integrate research findings from various sources, incorporate changes in Navy policies and priorities, disseminate findings and monitor their utility, and revise Convergence Charts and research plans and priorities on a regular planned basis. Such a system would enhance the credibility of Navy civilian personnel research and help ensure that it becomes increasingly focused and moves progressively toward the support of Navy mission objectives.

## NEED FOR A RESEARCH PLANNING STRUCTURE

The management of a planned program of civilian personnel research requires considerable coordination among the Navy offices that might sponsor or conduct the research, as well as with OSD, OPM or other agencies that might sponsor research very similar to that needed by the Navy. If all of these resources could be coordinated under a common plan, the Navy would make maximum progress along the research paths delineated in the Roadmap. Obviously, however, this requires an ongoing organizational capability to monitor, evaluate, disseminate, and revise planned research program.

Planned, objective-based research management is often neglected even by research organizations, and poses particular problems for organizations,

such as OP-14, where research is not the primary function. Without an on-going organizational capability, research plans can quickly become outdated and forgotten. It would be unfortunate, however, to fail to take full advantage of the collaborative effort expended thus far and the powerful tool that has been developed. With a relatively small on-going investment of resources, the Roadmap can continue to be a highly useful document to the Navy Civilian Personnel community for years into the future.

Two organizational elements are crucial to managing the research system: (1) an individual with primary responsibility for coordinating civilian personnel research planning and (2) an inter-organizational body which guides the associated planning and decision-making. The remainder of this section presents some specific recommendations on how these elements might be incorporated into the Navy civilian personnel structure.

## PLANNING COORDINATOR

Experience in many organizations suggests that if there is not a particular individual responsible and accountable for research planning coordination, the function is likely to fall by the wayside. This is not to say that the individual need not be supported by other resources within the organization's hierarchy, but simply that one individual must serve as a focal point for information gathering and preparation for decision-making. Ideally such a person would be skilled in research and would probably be located in OP-14, given the scope of its mandate, its level of ownership of the Roadmap, and its potential purview over both R&D and studies of the civilian workforce. Other options are, of course, possible, including NPRDC, NAVMAT, ONR, or contracted personnel. Each of these have potential limitations as well as advantages can best be weighed by the Policy Guidance Team. In any event, NPRDC and NAVMAT will continue to be crucial participants. A designated coordinator for R&D efforts within the NRPDC would be desirable, regardless of where overall research coordinator responsibility lies, as would a coordination point for studies by NAVMAT.

The key responsibilities of the research planning coordinator may be grouped into five major categories:

**FUNDING**

- Locate sources of funds for as many of the high priority research efforts as possible, tapping such sources as OP-14, OP-01, other OPNAV sponsors (such as OP-13), NAVMAT, NPRDC, non-Navy sources (e.g., OSD, OPM), etc.

- Prepare budget justifications, statements of work, and other documents necessary to facilitate orderly research funding.

**MONITORING**

- For all funded Roadmap projects, either serve as the Contracting Officer's Technical Representative (COTR) or coordinate with the COTR to keep informed of research progress and help insure that research is conducted in a manner consistent with Roadmap objectives.

- Coordinate with OSD, GAO, and other appropriate Federal agencies to keep informed of pertinent research that they support. This will include responsibility for keeping these agencies informed of Navy priorities and interests, serving on advisory committee, etc.

**EVALUATION**

- Collect and review all pertinent research or study reports to determine how well they answer questions and meet objectives posed in the Roadmap, or suggest additional research required to meet objectives.

**PLANNING**

- Revise convergence charts and priorities annually, based on the evaluation of previous research and input from designated key civilian personnel decision-makers.

- Conduct a major re-assessment of the Roadmap objectives, research areas, existing knowledge statements, and priorities every five years.

- Prepare necessary materials for the POM process.

## DISSEMINATION AND UTILIZATION

- Determine who would receive what information and its form.
- Provide for dissemination of readable, useful materials or meetings/workshops directly through ONR and/or through contracts.
- Periodically assess the impact and utility of research in the field.

## COORDINATING COMMITTEE

A research coordinating committee is needed both to provide guidance and direction to the research planning effort and to facilitate coordinated execution of the plan. The membership of such a committee could be similar to the current PGT or the proposed Navy civilian personnel research development and studies committees (Instruction pending).

Responsibilities of the committee would include the following:

- Meet annually to assess progress in carrying out the Roadmap and make revisions in the convergence charts and priorities, using information provided by the research planning coordinator;
- Serve as a resource group for the research planning coordinator, providing assistance in obtaining information about ongoing research and potential funding sources for planned research;
- Monitor research progress within the represented organizations to assure plan responsiveness; and
- Facilitate the exchange of information on research, assisting in obtaining broader input when needed and assuring that dissemination is responsive to organizational needs.

Ideally, the annual review process would take place in April in order to have optimum effect on the funding cycle. If specific priorities for the coming year could be established by April, the committee would be in the strongest position to influence the budget allocation processes in OP-01, NAVMAT, and OSD and to maximize support for its priority research programs.

Since the Convergence Charts and the results of the initial prioritization process should require only relatively minor modification from year to year, this process should not be overly burdensome--probably no more so than the previous, more separate, efforts to develop research plans each year. OP-14, NAVMAT and NPRDC have already made excellent strides toward a coordinated, planned research effort. Completion of the proposed prioritization process and implementation of the key features of the research management system described here should lead to the incorporation of a strong and productive civilian personnel research program.

# APPENDIX A

## STUDY PARTICIPANT LIST

## Study Participant List

## Navy Civilian Research Project

### Navy Civilian Policy and Operations Personnel

| Name | Affiliation |
|---|---|
| Mr. Jan K. Bohren | Director, Navy Civilian Personnel Command |
| Mr. Ronald C. Burow | Head, Personnel Management and Evaluation Branch<br>Civilian Personnel Policy Division |
| Mr. H. Lee Dixson, Jr. | Director, Civilian Manpower Division<br>Comptroller of the Navy |
| Mr. Reginald M. Felton | Head, Equal Employment Opportunity Programs Branch<br>Civilian Personnel Policy Division |
| Mr. Terry J. Haycock | Head, Labor and Employees Relations Branch<br>Civilian Personnel Policy Division |
| Mr. Leonard R. Klein | Assistant Deputy Chief of Naval Material (Manpower and Personnel)<br>Naval Material Command |
| Mr. Thomas E. Lindsey | Head, Training and Career Management Branch<br>Civilian Personnel Policy Division |
| Ms. Sue M. Martin | Head, Executive Personnel and Performance Appraisal Systems Branch<br>Civilian Personnel Policy Division |
| Ms. Dorothy M. Meletzke | Deputy Director, Civilian Personnel Policy Division |
| Mr. Thomas R. Muir | Assistant Deputy Chief of Naval Operations (Civilian Personnel/Equal Employment Opportunity) |
| Mr. George P. Steinhauer | Head, Staffing and Pay Systems Branch<br>Civilian Personnel Policy Division |
| Mr. Joseph K. Taussig, Jr. | Deputy Assistant Secretary of the Navy (Civilian Personnel Policy/Equal Employment Opportunity) |

## Navy Civilian Program Managers

| Name | Affiliation |
|---|---|
| Dr. James E. Colvard | Deputy Chief of Naval Material<br>Navy Material Command |
| Dr. Angelo J. Di Mascio | Deputy Commander, Naval Air Systems Command<br>Naval Air Systems Command |
| Mr. Robert M. Hillyer | Director, Navy Laboratories<br>Headquarters, Naval Material Command<br>(now Technical Director, Naval Ocean Systems Center, San Diego) |
| Mr. James H. Mills, Jr. | Executive Director, Weapons and Combat Systems Directorate<br>Naval Sea Systems Command |

## Navy Military Program Managers

| Name | Affiliation |
|---|---|
| Captain Richard W. Blaes | Director, Ships Systems Logistics Division<br>Headquarters, Naval Material Command |
| Captain Bradley A. Butcher | Assistant Deputy Chief of Naval Material<br>for Reliability, Maintainability, and<br>Quality Assurance<br>Headquarters, Naval Material Command |
| Vice Admiral James B. Busey | Commander, Naval Air Systems Command<br>Naval Air Systems Command |
| Rear Admiral A.J. Herberger | Director, Military Personnel Policy<br>Division<br>Office of the Chief of Naval Operations |
| Rear Admiral John C. McArthur | Director, Industri Facilities and<br>Management<br>Naval Sea Systems Command |
| Captain Phillip Monroe | Commanding Officer<br>Naval Air Rework Facility<br>Naval Air Station, San Diego |
| Captain J. Murphy | Military Personnel Policy Division<br>Office of the Chief of Naval Operations |

## Military Civilian Personnel Research Community

| Name | Affiliation |
|---|---|
| Dr. Patrick Conklin | Assistant Dean for External Affairs<br>Federal Executive Institute |
| Dr. Allen Lau | Research Psychologist<br>Army Research Institute |
| Dr. Robert E. Matson | Dean<br>Federal Executive Institute |
| Dr. Richard J. Niehaus | Assistant for Human Resources Analysis<br>Office of the Chief of Naval Operations |
| Ms. Lorraine G. Ratto | Assistant for Civilian Personnel Research<br>Navy Personnel Research and Development Center |
| Dr. Jeffrey Schneider | Scientific Officer<br>Office of Naval Research |
| Dr. James W. Tweeddale | Technical Director<br>Navy Personnel Research and Development Center |

## Civilian Employee Organizations

| Name | Affiliation |
|---|---|
| Mr. Bryan J. DeWyngaert | Administration Assistant to the National Presiden<br>American Federation of Government Employees |
| Mr. Bun B. Bray, Jr. | Executive Director<br>Federal Managers Association |
| Mr. James Peirce | National President<br>National Federation of Government Employees |

## Navy Civilian Personnel Directors

| Name | Affiliation |
|---|---|
| Mr. John R. Curran, Sr. | Director, Civilian Personnel<br>Headquarters Naval Material Command |
| Mr. James P. Early | Director, Civilian Personnel<br>Norfolk Naval Shipyard |
| Mr. Richard McCawley | Director, Civilian Personnel<br>Naval Air Rework Facility<br>Naval Air Station, San Diego |
| Mr. William B. Wagoner | Director, Civilian Personnel<br>Naval Air Station<br>Patuxent River, Maryland |

## DoD and OPM Civilian Policy Personnel

| Name | Affiliation |
|---|---|
| Ms. Karen C. Alderman | Acting Deputy Assistant Secretary of Defense for Civilian Personnel Policy and Requirements<br>Office of the Assistant Secretary of Defense (MRA & L) |
| Dr. Helen Cristrup | Acting Assistant Director<br>Office of Staff and Policy<br>Office of Personnel Management |
| Mr. Patrick S. Korten | Executive Assistant Director<br>Office of Policy and Communications<br>Office of Personnel Management |

# APPENDIX B

# INTERVIEW GUIDE

Date _____ Name _____

Interviewer _____

Position and Primary Responsibilities:

**Note:** Prior to the interview, the interviewee will be given a copy of the objectives and background information about Roadmap Research. They will be asked to respond to each objective in the order in which they feel themselves to be the most knowledgeable about pertinent research needs.

**Objective A: DETERMINE CIVILIAN PERSONNEL MANPOWER NEEDS**

The following set of questions pertain to the objective of determining civilian personnel manpower needs in two areas:

1) **Ascertaining appropriate civilian functions within the Navy organization and**

2) **Forecasting the number and types of needed civilian personnel.**

A.1 What additional information do you or does the Navy need to know in order to ascertain what are appropriate civilian functions within the Navy?

A.2 What additional information do you or does the Navy need to know in order to be able to forecast the number and types of needed civilians for the future?

A.3 Of the information needs you have mentioned, (reiterate) which would you consider the most important to determining civilian personnel manpower needs? The second most important?

A.4 Who else might use this information and how could it be used?

A.5 Do you know of any studies or information already available in this area? If so, please describe.

OBJECTIVE B: RECRUIT CIVILIAN PERSONNEL

The following set of questions are concerned with the recruitment of civilian personnel, in three different areas:

1) **Making jobs attractive to the target audience,**

2) **Establishing mechanisms for reaching and selling the target population, and**

3) **Establishing mechanism for screening and selecting individuals.**

**B.1** What additional information do you or does the Navy need to know in order to make its civilian jobs more attractive to the target audience the Navy needs to recruit?

**B.2** What additional information do you or does the Navy need in order to establish more effective mechanisms for reaching and selling the target population?

**B.3** What additional information do you or does the Navy need to have in order to establish mechanisms for screening and selecting individuals?

**B.4** Of the information needs you have mentioned (reiterate) which would you consider the most important in recruiting civilian personnel effectively?
The second most important?

**B.5** Who else might use this information and how could it be used?

**B.6** Could you describe any studies or research efforts already available in this area?

## OBJECTIVE C: RETAIN NEEDED CIVILIAN PERSONNEL

The following set of questions pertain to the objective of retaining needed civilian personnel in three areas:

1) **Providing attractive compensation and job conditions,**

2) **Providing career development opportunities, and**

3) **Assuring equity within classification and performance appraisal.**

**C.1** What additional information do you or does the Navy need to know in order to provide more attractive compensation packages and job conditions for civilian personnel?

**C.2** What additional information do you or does the Navy need to know in order to more effectively provide career development opportunities for its civilian personnel?

**C.3** What additional information do you or does the Navy need to know in order to better assure equity within the classification and performance appraisal areas?

**C.4** Of the information needs you have mentioned (reiterate) which would you consider the most important in retaining civilian personnel? The second most important?

**C.5** Who else might use this new information and how could it be used?

**C.6** Can you describe any studies or research efforts already available in this area?

OBJECTIVE D: MAXIMIZE PRODUCTIVITY OF CIVILIAN WORKFORCE

The following questions pertain to productivity objectives in four areas:

1) **Motivating personnel for highest performance level,**

2) **Developing and maintaining the knowledge, skills and abilities needed to meet current and projected job requirements,**

3) **Reducing extrinsic barriers to job performance such as health and safety issues, and**

4) **Developing an organizational climate, structures and procedures to accomplish tasks.**

D.1 What additional information do you or does the Navy need to know in order to motivate personnel to a high performance level?

D.2 What additional information do you or does the Navy need to know in order to more effectively develop and maintain knowledge, skills, and abilities needed to meet current and future job requirements?

D.3 What new information do you or does the Navy need to know to reduce barriers to job performance (such as health and safety issues)?

D.4 What new information do you or does the Navy need to know in order to develop a more effective organizational climate to accomplish its mission?

D.4.1 A more effective structure?

D.4.2 More effective procedures?

**D.5.** Of the information needs you have mentioned (reiterate) which would you consider the most important in terms of maximizing productivity? The second most important?

**D.6.** Who else might use this information and how could it be used?

**D.7.** Can you describe any studies or research efforts already available in this area?

## OBJECTIVE E: CREATE AND MAINTAIN EQUAL EMPLOYMENT OPPORTUNITY

The following set of questions pertain to the objective of creating and maintaining equal employment opportunity in two areas:

1) **Recruiting and retaining adequate numbers and representation of minorities, women, handicapped and**

2) **Insuring equitable treatment and advancement opportunities within the civilian personnel system.**

**E.1.** What additional information do you or does the Navy need to know in order to recruit and retain adequate numbers and representation of minorities, women and handicapped?

**E.2.** What additional information do you or does the Navy need to know in order to insure equitable treatment and advancement opportunities within the civilian personnel system?

**E.3.** Of the information needs you have mentioned (reiterate) which would you consider the most important in creating and maintaining equal employment opportunity? The second most important?

**E.4.** Who else might use this information and how could it be used?

**E.5.** Do you know of any studies or research efforts already available in this area of creating and maintaining equal employment opportunity?

OBJECTIVE F: **TO IMPROVE THE COST-BENEFIT OF SPECIFIC CIVILIAN PERSONNEL FUNCTIONS**

**F.1.** What additional information do you or does the Navy need to know in order to improve the cost-benefit of specific civilian personnel functions?

**F.2.** Of the information needs you have mentioned (reiterate), which would you consider the most important in improving cost-benefits? The second most important?

**F.3.** Who else might use this new information and how could it be used?

**F.4.** Do you know of any studies or research efforts already available in this area?

**G.** Are there any major areas of research needs which we have not discussed?

# APPENDIX C

# LIST OF REFERENCES

## LIST OF REFERENCES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